Scientific American.

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES.

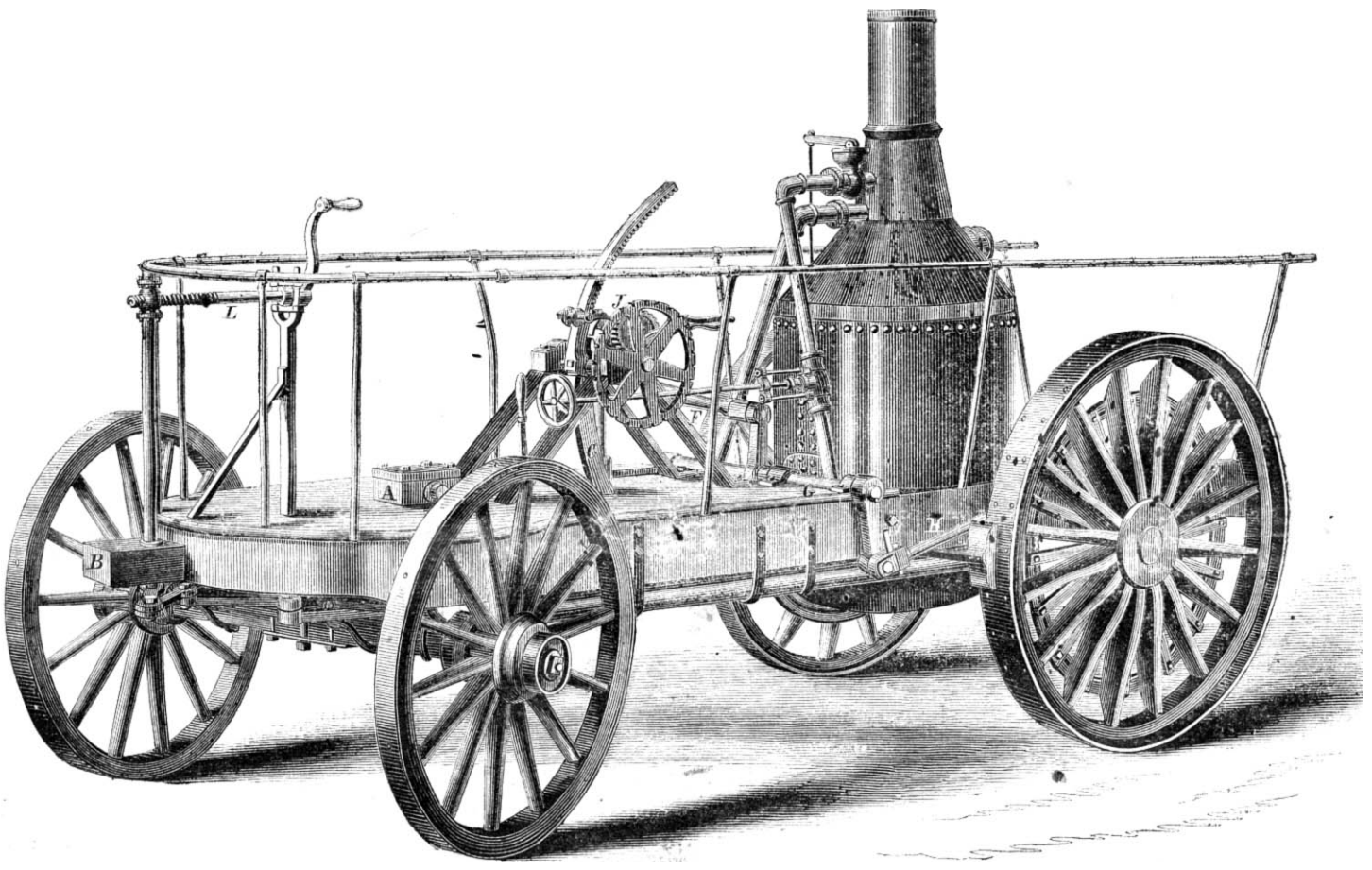
Vol. XIII---No. 8. NEW SERIES. NEW YORK, AUGUST 19, 1865. $3 PER ANNUM IN ADVANCE.

Improved Steam Carriage.

The ingenuity of inventors and engineers has, for many years, been directed to perfecting the steam carriage so as to adapt it for traffic on common roads, and thus open another field for usefulness to the steam engine. In years gone by steam carriages ran on common roads in England, and some were in operation for months, carrying passengers between different points with regularity. From various causes, the chief one being unpopularity, they were discontinued, and we believe there are none now at work in the United Kingdom except traction engines for hauling heavy timbers in shipyards, or carrying loads on highways for short distances. In France, we learn by recent foreign advices, that a line of steam carriages has been established between two provincial towns, but no particulars are given of the engines or their details.

In this country the steam carriage has been the subject of much thought, and many valuable improvements have been made in it. Among the later machines may be classed the self-propelling steam fire engines of Lee & Larned, and Latta, of Cincinnati. One of Lee & Larned's engines is occasionally in use as a steam fire engine in this city; several of them were built years ago, but the *John Storm* is the only one now in existence; the others were torn to pieces after short service. Mr. Richard Dudgeon, of 24 Columbia street, New York, an accomplished machinist, built a steam carriage which ran publicly in this city on several occasions. It was destroyed by fire in the Crystal Palace. Mr. S. H. Roper, of Boston, has lately built a steam carriage which weighs but 450 pounds. These are not the only ones ever constructed here; we might mention many ambitious attempts which failed, but we think further mention of them unnecessary at this time.

Mr. Perry Dickson, of Erie, Pa., has recently invented a steam carriage for common roads that can also be instantly converted into a stationary engine without disconnecting any part whatever. We give very full illustrations of it, both in perspective and in detail.



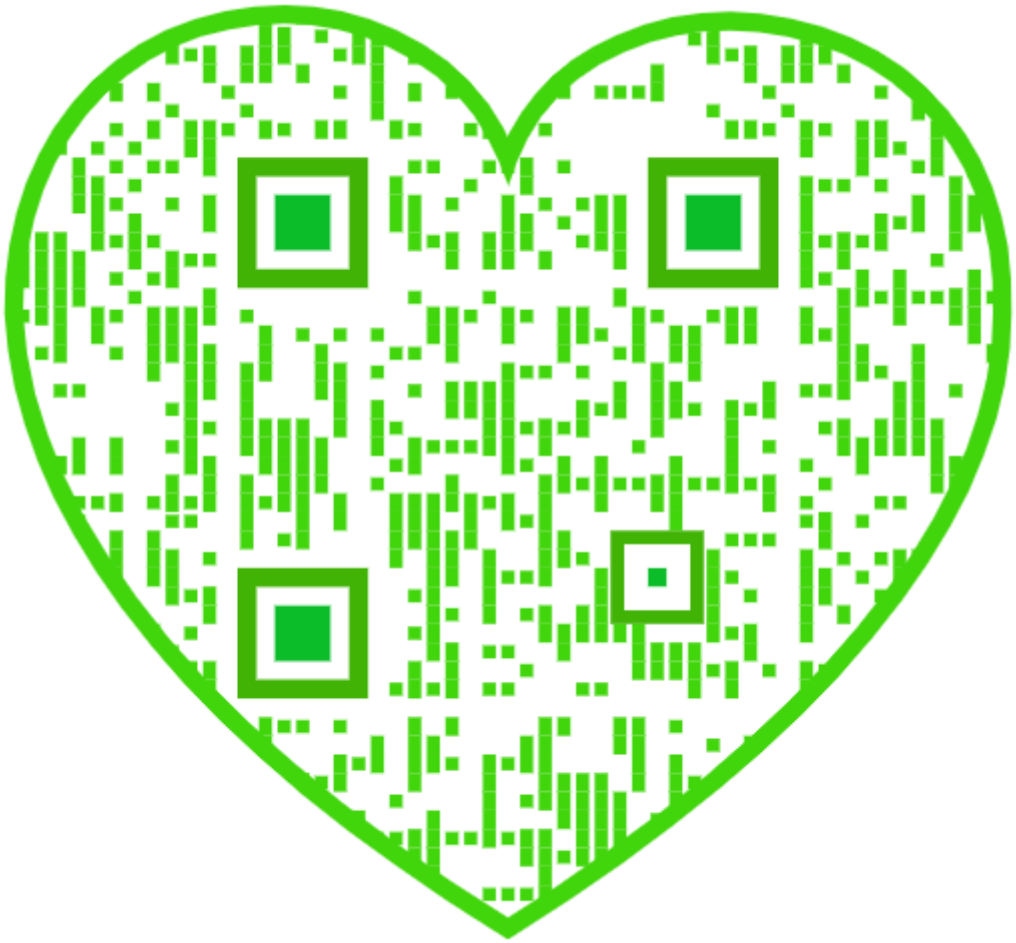
DICKSON'S STEAM CARRIAGE.

The perspective view represents a machine which was constructed the past winter and is now in successful operation. In Fig. 1 the details are shown. The distinguishing feature of this engine is the arrangement for graduating the power of the engine to the work to be done, so that heavy grades, or stiff miry ground, can be ascended or run over with ease. The arrangement of the machine to effect this is shown in Fig. 1, and consists in applying the power of the engine nearer to or further from the axle, and in this way exerting greater force upon the wheels when unusual obstacles oppose them. This alteration can be made at any time while the engine is in operation. There is another novelty in the way the power is transmitted to the driving wheels. This consists in a toggle-joint movement, so arranged that one arm bites on the inner face of a metallic wheel bolted to the driver—thus dispensing with a crank and allowing the engine to work freely in all positions or inequalities of the ground; it also allows the side levers to make a short or long stroke.

Mr. Dickson has shown a good deal of ingenuity and originality in his ideas and in putting them in practical form; following is a description of this machine.

In the engraving, Fig. 1, the cylinder, A, is attached to the main frame, B, and oscillates thereon. The piston rod connects to a quadrant, C, which has centers or bearings at D, so that when the engine is in motion the quadrant will have a rocking movement to and fro. On this quadrant there is a sliding head, E, to which the connecting rod, F, is jointed. This latter rod gives motion to a transverse rock shaft, from which the main rods, H, run to the driving wheels, as before explained.

The connecting rod, F, is jointed, and has a forked end, which enables it to embrace the link, and the sliding head is furnished with a rack, I, through which the head is raised up or lowered down on the quadrant; suitable means are provided to retain the sliding head, E, in its working position wherever it may be placed. Fig. 4 is a front view of the quadrant, showing the method by which it is operated; that is, through the wheels, J. There is a small fly-wheel, K, attached to the frame, which serves to steady the motion of the engine and operate the valves thereof; it is also a driving pulley to run any kind of machinery independent of the carriage, if it is ever needed. By these arrangements—that is, the sliding link for regulating the amount of power to be transmitted to the driving wheels, and the substitution of the toggle-jointed arm acting on the driving wheels for the crank motion, it is possible to use one cylinder in-



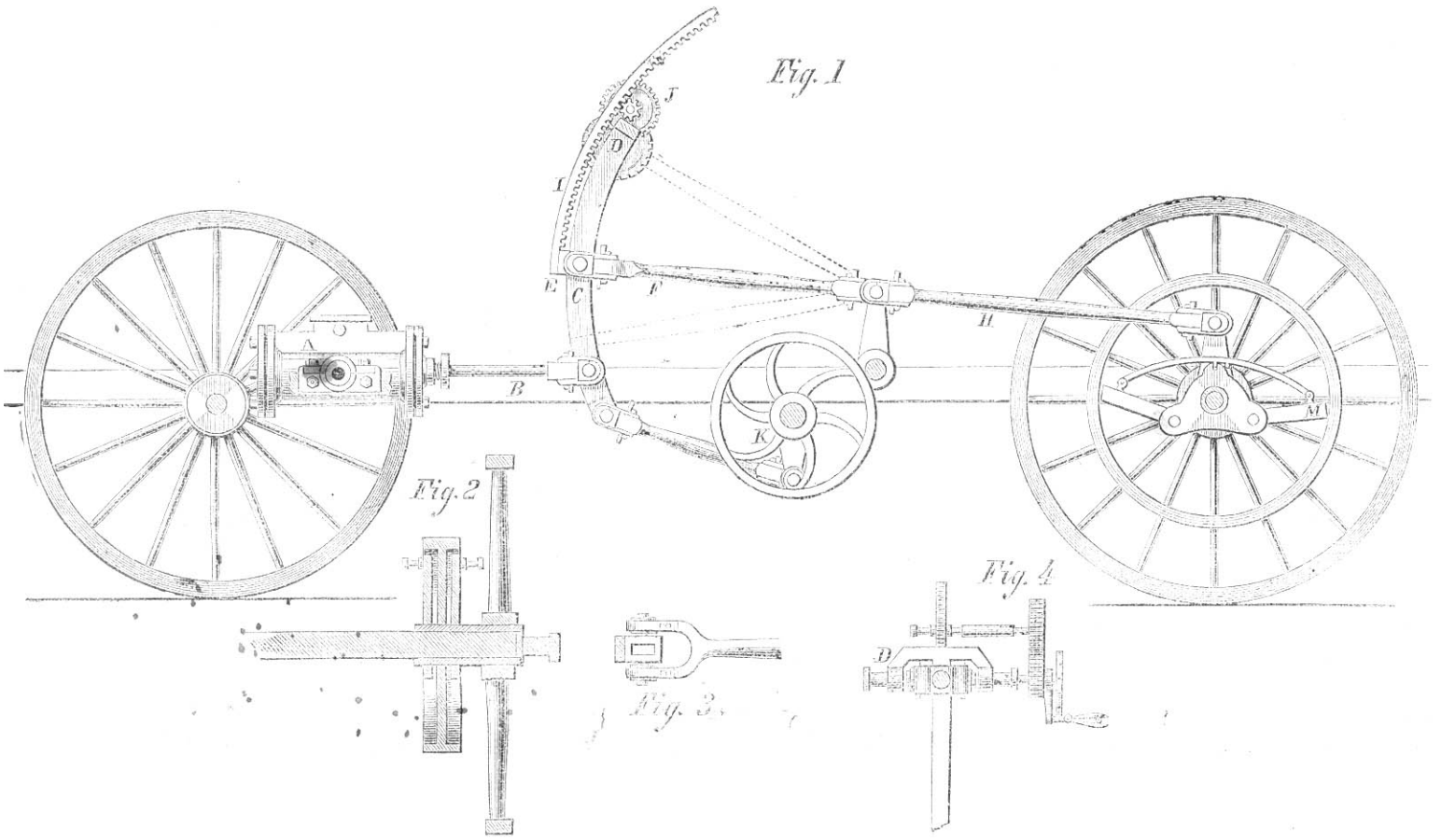
stead of two, thus simplifying the apparatus, reducing the weight, and enabling the machine to be started at any time, for there are no dead centers to overcome, and the motion is easy and continuous. The machine is capable of going in any direction, either backward or forward, by throwing either set of the toggle-jointed arms, M, in or out, and it is steered in front by gear, L, there placed. When the sliding head is moved up until it is in line with the rock shaft it is then at the point of no motion, but the engine yet runs while the carriage stands still. In this way the power may be used for driving pumps or other machinery of any kind whatsoever, and this without disconnecting any rod.

tion of time. In different places I work it with a short stroke, and then it runs and continues to run with perfect safety, whereas, if it were the *John Storms*, or an engine that had to make a full stroke or nothing, then I must let on steam until it *started*. As soon as it started it would have too much steam on and would go smash into some catastrophe before it could be stopped. The rotary motion of the driving wheels is perfect, and there is no need of two engines for such a purpose. I can get more accommodation out of one simple lever than there would be in all the cog wheels that an English traction engine would be able to haul."

This carriage was patented November 25, 1862, by

practice and school ship for naval apprentices, under the command of Lieutenant-Commander R. B. Lowry, U. S. N., who was specially selected by the Navy Department for the very important and arduous duty of organizing and establishing on a firm basis the nucleus from which the future rank and file of the navy were to emanate, and in such a form as not only to be reliable at all times, but of a character which would place our vessels upon an equality, if not make them superior, to those of any naval power.

Owing to the want of proper attention on the part of some recruiting officers, and the desire of many parents to place their boys in the service, either in hopes of receiving part of their pay or for the pur-



ELEVATION OF STEAM CARRIAGE.

The inventor has some ideas of his own on this subject which we take pleasure in printing as he has written them. He says:—

"Suppose my machine in the same depot with the *John Storms*, when the fire-bell rings and "Barnum's" is on fire. So soon as I get five lbs. of steam I can start and run slowly; by the time I get opposite your office [twenty rods from the depot.—EDS.] I have ten lbs. of steam, and have turned my hand crank and increased the speed two to one. As soon as the steam is high enough for more speed I keep turning the crank and lengthening the stroke, and thus get to the fire as early as any horse-drawn engine. And further, I can get there and have hose all attached by the time my steam is sufficient to throw water, and I have spent no time connecting or disconnecting anything except the hose.

"Let us go back and look after the *John Storms*, which has had to stay at the depot until it is smoking hot; it must have a pressure of steam sufficient to go a whole length stroke, or none, before it can start, and, after it gets to the fire, it must be taken apart and put together again to make a stationary engine of it, during which time poor "Barnum" might get badly burned.

"Some people propose to build three engines to accomplish the object of one fire engine; to do this the engines would weigh twelve tuns. Such an engine would destroy so much pavement that if there was a fire the people in the neighborhood would keep still about it, for fear the engine would come.

"My engine is eight-horse power, weighing fifty-three hundred—which is some ten hundred more than is necessary, it being the first one ever made on my plans. I have ascended grades of one foot in four, and find that climbing steep grades is only a question of time. I can get more accommodation out of one simple lever than there would be in all the cog wheels that an English traction engine would be able to haul."

Perry Dickson; for further information address him at Erie, Pa.

OUR NAVAL APPRENTICE SYSTEM.

The need of a naval apprentice system which had been once tried in our service and failed, owing to a variety of causes, made itself apparent at the commencement of the rebellion. The scarcity of naval seamen, men who were conversant with the routine and duties of men-of-war, gave the department much anxiety and caused considerable delay in fitting out vessels for the pressing and important demands of that time. It had been supposed that the fishermen, to whom the Government has been paying large bounties for many years, would come forward in the event of war and pay back these munificent gifts which they had been receiving. In this the department were disappointed.

The navies of other powers have their apprentice and training schools, and England especially is noted for her wisdom and foresight in the education of boys for service on board war vessels. In this country the system has at times been ridiculed, although some of our best naval officers have approved the plan, while others have objected to it mainly on the ground that at its organization they would be subjected to the arduous work of bringing it to perfection, forgetting that in these apprentices who, having once become thoroughly instructed in seamanship and naval gunnery, would in the course of a few years become the bone and sinew of our naval strength and pride.

Our apprentice system was formally inaugurated by an act of Congress dated March 2, 1837, but after many disappointments it was abandoned in 1843, and was not revived until 1864. In May of last year the *Sabine* was ordered to be put in commission as a

pose of ridding themselves of troublesome, incorrigible or refractory sons, a large number of worthless, and, in some instances, vicious boys were sent on board. Many persons seemed to think that this was a school of reform for bad boys, and availed themselves of the privilege of confining their wicked offspring in a man-of-war at the expense of the Government. Nothing could have been more foreign to the plan of the Navy Department than the enlistment of such a class of boys, and upon the proper representations the naval rendezvous ceased to take any more boys, and the enlistment was only consummated on board the school ship.

The mistake of careless enlistments was speedily rectified. Under the present system of careful scrutiny and care which is exercised in the preliminary examination, it is almost impossible for any bad boy to obtain admittance into this interesting and promising body of embryo naval seamen. The greatest care is taken in the selection of boys. They must be 14 and not over 18 years of age. At 14 they must measure not less than four feet eight inches in hight and 27 inches around the chest, and at 15 years the hight must be four feet ten inches and 29 inches around the chest. Each candidate must be able to read, write and spell, be free from physical disabilities, well grown, healthy, active, and exhibit an aptitude for the ocean and the duties of sea life.

To guard against bad characters, the candidate must be of good moral standing, not an indentured apprentice, must never have been charged or convicted of crime. He must be a willing applicant, and must have the written consent of his parent or guardian. Parents can rest assured that applicants will be compelled to undergo a thorough examination as to their moral and physical qualifications. It

is determined by the department to have none but good and promising boys enter this school; those who will be a credit to the country and will not contaminate the boys who are now on board. Sickly and effeminate boys will not be taken; the Government cannot afford to keep a naval hospital nursery school for invalid boys, any more than to provide a juvenile house of reformation for boys with sea going proclivities. Therefore the public are to understand that any attempt to foist upon the service sickly boys, with a view to improve their health, or refractory boys to establish their future morals, will be met at this school with a firm refusal, and that time and money employed in such efforts will be uselessly expended. The apprentices are bound by the consent of their parents and guardians to serve their country until they are 21 years of age, receiving for their services their living and pay, which varies from eight to ten dollars per month, a portion being retained until the term of service expires.

After passing the examination before the surgeon and instructors, the paymaster furnishes the apprentice, for immediate use, the following articles of clothing:—one pea-jacket, cloth cap, pair of cloth trowsers, flannel over and under shirts, pair of drawers, shoes, neck-tie, socks, white duck pants and frock, comb, knife, pot, pan and spoon, one bar soap, clothes bag, and a badge. The boy is then taken to the ship's corporal, who assists him in the transformation from a landsman to a sailor boy. Next the sailmaker furnishes him with a hammock—his bed until of age. Then the master-at-arms places him in a mess, and at the same time gives him a printed form, on which is registered his number, that of his bag and hammock, a list of his clothing, and points out the place where he is to swing his hammock. Each boy has a number given him when he enlists, and he retains that number as long as he is an apprentice. Thus "191" is always "191," no matter where he is transferred.

For the first two or three days after coming on board the boy is allowed some latitude, and is under the care of the ship's corporal and other petty officers, who instruct him in the general routine of the vessel, and in a familiar and friendly way smooth the first steps of the little stranger. Gradually he begins to feel at home, and on the fourth day of his new life he is mustered before the executive officer, who assigns him to the proper classes for instruction. On the afternoon of that day he is furnished with the balance of his clothing, and from that time he becomes fully identified with the daily routine of the ship and school. The treatment of the boys is of parental character, and made to conform to the requirements of young and growing minds and bodies.

One tailor is allowed to every hundred boys, whose duty it is to repair their clothing, and instruct them in the art of repairing, cutting and fitting their own clothes. The boys *must* learn this branch of nautical accomplishments. One great trouble which has arisen in reference to clothing the boys is, that they are served with men's sizes, none other being made by the contractors. Of course they are too large, and some time must elapse before a new boy can be fitted out in uniform. Much time and considerable valuable material is lost by this state of things. A shoemaker and barber attend to the feet and head of the boys. A fine barber's shop and bath room are located forward on the starboard side of the vessel, and to enforce cleanliness and cultivate a taste as well as the habit for the care of the person is one of the first laws of the school.

The moral training of the apprentices is very carefully attended to by the officers; and the kind, parental supervision of Rev. Mr. Salter, chaplain of the ship, gives a guaranty of its faithful performance. Divine services are held every Sunday, and are of a character both simple and instructive. No pompous or weary discourses are given to prejudice the young and restless mind against religious service, and no sectarianism is forced upon them. A Sunday school to teach Bible history is being organized, and good books and papers are distributed at stated intervals. The boys own a fine and well-selected library of about one thousand volumes. Great care is taken of them, and they are read with much interest.

The naval apprentice system is working admirably, and promises great success. It is of much importance to us as a nation, and is worthy of support and commendation. The sailing corvette, *Savannah*, will be put in commision in a day or two, and be moored in New London as a permanent receiving and practice ship of the school. The steam gunboat, *Tioga*, is now on the Eastern coast recruiting boys. The *Michigan*, on the lakes, is also employed in the same service. It is hoped in a short time to obtain three or four thousand boys for this great work.—*Boston Commercial Advertiser.*

The "Crib" for the Chicago Lake Tunnel.

The walls of the crib are constructed of blocks or logs, hewn square, and one foot in thickness. The distance between the walls is eleven feet, leaving with the inmost wall a pentagonal inclosure, comprising an inscribed crib of twenty-five feet in diameter. The crib is barred so thoroughly that it might be tumbled over without injury. It contains 750,000 feet of lumber, hand measure, and about 150,000 pounds of iron bolts, making in all about 1,800 tuns weight. The outside wall was thoroughly caulked, equal to a first-class vessel, and over it was placed a layer of lagging, to keep the caulking in place and protect the crib from the action of the waves. It will stand about seven feet above the water-line, and five feet will be built above.

The center of the crib is a large hollow space into which a huge cylinder of cast iron, nine feet in diameter, will be lowered in sections about ten feet in length. The lower section will have a chisel edge to cut through the soil. The joists are water-tight, with broad flanges turned true and grooved so as to take in a ridge of cement. The cylinder will pierce the clay to the total depth of sixty-four feet from the surface of the water. After reaching the bed of the lake, the top will be covered with a plate of iron, and the tube exhausted by means of an air pump. The pressure of the atmosphere outside will force the piece into the ground. The air will then be admitted, another piece lowered to it, and the same process repeated. This will be continued till the entire cylinder is fixed. When this is done, all will be ready for the workmen to descend into the tube of the cylinder and proceed to excavating. It is expected that this will be about the middle of September. The water will be pumped out and the workmen will then begin to excavate, striking out to meet those at the other extremity. It is considered to be certain that the engineers have made their calculations so accurately, that the party of workmen excavating from the way of the crib will, in about a year, meet those at work on the present tube, and the walls of the tunnel fit exactly together.

It is intended, when the tunnel shall have been completed, to let in the water through the sluices in the walls of the crib. At this point the water is very pure and clear. It has never been found to contain more than eight grains of solid matter to the gallon; and the distance from shore, two miles, is so far that storms will not affect its quality. The northwestern current in the lake will carry away the filth emptied into the lake round the head and to the Michigan shore. The tunnel ascends or slopes, as it goes out from the shore, about two feet per mile. Many apprehend that the pressure of the water on its first entrance will sweep away the brick work and collapse the walls; but as the bricks are set into the clay, which is almost as firm as solid rock, and the internal pressure of water will be equivalent to that from the outside, this is hardly to be feared. If nothing occurs to interrupt the completion of the tunnel, or to destroy it when finished, Chicago will have secured an inexhaustible supply of as pure and wholesome water as is to be found on the western continent.—*Financial Chronicle.*

The Electrical Torpedo.

We have recently had occasion to refer to the experiments which have been carried out at Toulon with this subtle agent; others have since been instituted on a much larger scale, and with extraordinary results. Hitherto the torpedo has not been properly appreciated as a defense in war; but it is now an established fact that it is as available for defense as ironclads and rifled guns are for attack. Mr. Nathaniel J. Holmes, however, and the scientific gentlemen associated with him, have recently made such progress in this new department of military engineering, that hereafter, in all plans for coast, harbor and river defenses, and in all works for the protection of cities, whether against attack by armies on land or by ships afloat, the electrical torpedo will probably play an important part. The latest experiment made by the French Government at Toulon, affords some idea of the amount of destructive power which lies stored up within the electrical torpedo. With a charge of little more than 100 lbs. of gunpowder, a vessel 150 feet long, and upwards of 40 feet broad, was instantaneously destroyed while floating in deep water in apparent security. At the word of command, given by Admiral Chabannes, a dull crashing sound filled the air, and the devoted craft was effaced from the surface of the water. The portions of the vessel examined afterwards all bore testimony to the tremendous effects of the concussion even with a water depth of 16 feet clear between the ship's bottom and the top of the sunken torpedo, and with a charge of only 100 lbs. of powder. Striking as was the experiment performed by Admiral Chabannes, it is said to have been but a rough indication of the power embodied in the new engine of defense. The French Government have signified their intention to repeat the experiment, and to add to it another in which a ship will be annihilated under full sail. Meanwhile Mr. N. J. Holmes affirms that he has not revealed the secrets discovered by him with respect to the practical employment of the torpedo in warfare. The result of this experiment plainly indicates what may be expected to accrue to even an ironclad, if sailing within range of one of those formidable engines of multiplied power.—*Mechanics' Magazine.*

The Cotton Supply.

Cotton goods are nearly as high now as when gold was at 250—45 and 50 cents a yard being the price for good qualities. The Cincinnati *Times* says:—"From a variety of Southern letters we deduce the conclusion that there will be a very small yield of cotton this year. In pursuance of Jeff Davis's orders the people had generally planted their lands in grain. There will be an unusually large corn crop, which will save the people from starvation, but owing to the scanty yield of cotton, very little money. This will, perhaps, prove a good state of affairs yet for the South. Their old system of labor is broken up, and planters will find it impossible to manage immense farms. They will be compelled to subdivide and sell. This will bring immigration into the country, and the destruction of that wealth which was the sub-stratum of a heartless aristocracy, will conduce to elevate the masses, who have been hitherto kept under."

Filthy Currency.

About fifty thousand dollars' worth of fractional currency, defaced or worn, is redeemed per day, and an equal quantity of new issued in its place. The entire amount of fractional currency being upwards of $21,000,000, the re-issue at such rate of new notes for the whole amount, occurs once only in fourteen months. This period is entirely too protracted, for the notes in that time get dirty, greasy, and repulsive to use. Convenience of the public and a sure preventive of successful counterfeiting could be effected by devising a method of redemption and re-issue that would renew the outstanding fractional currency once in every six months or oftener. The expense of this to the Government would be inconsiderable. A proper standard of cleanliness could be established, and all notes below it paid for taxes or for postage might be retained redeemed, and new ones supplied.—*Internal Revenue Record.*

GAS MACHINES.—The gas companies will probably have their own way until machinery is perfected by which every family or neighborhood can manufacture its own gas; but the machinery for that purpose is every year becoming more complete and easily managed, by the improvements of inventors who are busy with them. The gas companies of this city and Brooklyn are the best friends of these inventors, for their extortionate charges prepare the public to welcome any change, and hasten the day when no house will be thought comfortably furnished without a gas retort in the cellar.—*Post.*

THE propellors *Meteor* and *Fewabic* collided in Thunder Bay, Lake Huron. The *Fewabic* was sunk in three minutes, and from seventy-five to one hundred lives are supposed to have been lost.

Improved Lamp Chimney.

This chimney is said to be a great improvement over the common ones used on kerosene lamps. The inventor says:—"It is less liable to break from expanding and contracting—being of equal thickness throughout—whereas the ordinary chimney is large in the center and small at each end. As a proof of the capability of this chimney to resist a sudden application ot cold when heated, water may be sprinkled upon one of them with impunity, while a single drop upon the others will fracture them. They can be cleaned as readily as a tea-cup, which is quite an advantage. The cap, suspended on the top of the glass by the wires which support the shade, intensifies the light very much, and the heat is not great enough by this arrangement to injure a paper or metal shade in the least. The average breakage of these chimneys is very much less than the ordinary kinds, and they are in all other respects adapted to lamps now in use."

A patent on this chimney is pending through the Scientific American Patent Agency, by Jos. H. Connelly, of Wheeling, West Virginia; for further particulars address him at that place.

Fig. 1

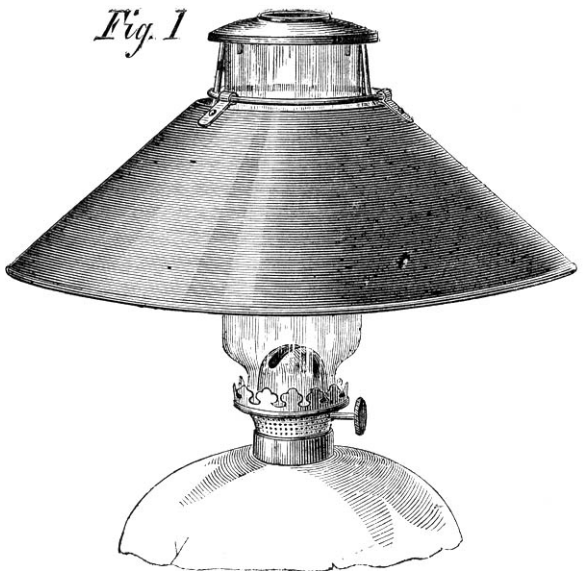
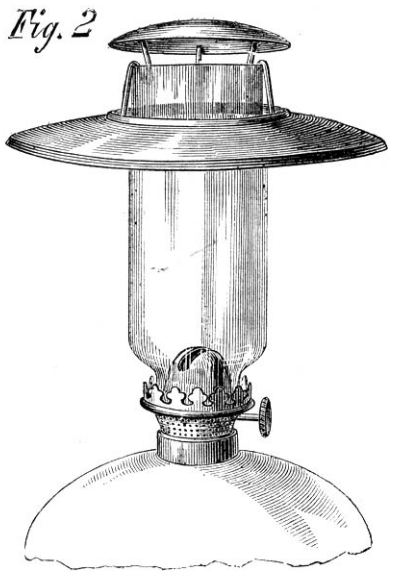


Fig. 2



CONNELLY'S LAMP CHIMNEY.

NOTES ON NEW DISCOVERIES AND NEW APPLICATIONS OF SCIENCE.

Professor Wheatstone has constructed a very powerful thermo-electric battery on the principle of that exhibited by Mr. Ladd at the Royal Institution. The battery constructed by Professor Wheastone consists of sixty pairs of small bars, and its electro-motive force is said to be equal to that of two of Daniell's cells. The battery was recently exhibited to a select circle of Professor Wheastone's friends, and it is stated that "on connecting the terminals of this battery, excited as Marcus's, a brilliant spark was obtained, and about half an inch of fine platinum wire when interposed was raised to incandescence and fused; water was decomposed, and a penny electro-plated with silver in a few seconds, while an electro magnet was made to lift upwards of a hundred weight and a half. Bright sparks were obtained from the primary and secondary terminals of a Ruhmkorff's coil connected with the battery. In fact, all the effects obtained from small voltaic combination were reproduced with ease by this thermo-electric battery." In constructing this battery, Professor Wheatstone found confirmation ot the curious fact, first announced by M. Marcus, that the power of a battery of this kind is very greatly increased by frequently remelting the alloys of which its elements are composed. This is supposed to be due to the repeated fusion breaking down the crystalline structure of the alloys.

Not unnaturally, this thermo-electric battery is exciting the imaginations of men of science, causing them to call up wonderful visions of a future when much of the work of the world shall be done by *sunshine*. Thus a cotemporary suggests that, "like windmills, thermo-electric batteries might be erected all over the country—finally converting into mechanical force, and thus into money—gleams of sunshine, which would be to them as wind to the sails of a mill. What stores of fabulous wealth are, as far as our earth is concerned, constantly wasted by the non-retention of the solar rays poured on the Desert of Sahara. Nature here refuses to use her wonderful radiation-net, for we cannot cover the desert sands with trees, and man is left alone to try his skill in retaining solar energy. Hitherto helpless, we need not be so much longer, and the force of a Sahara sun may be carried through wires to Cairo, and thence irrigate the desert, or, possibly, if need be, it could pulsate under our streets, and be made to burn in Greenland." A fascinating dream enough—and one which may prove to be "not all a dream."

In extracting gold and silver from their matrices by the process of amalgamation, the mercury employed often "sickens" and "flours." "Sick" mercury is mercury which has become tarnished at the surface by ox dation; "floured" mercury is mercury which has been tarnished by combination with sulphur. When triturated, in the amalgamating machines, with the rock from which the gold or silver is to be extracted, mercury tarnished by either of the causes mentioned "breaks up into minute particles, which will not again unite, and are carried off with the slimes, so that with many ores the loss of mercury forms a considerable item in the cost of extracting the precious metals." Mr. Crookes, however, the editor of the *Chemical News* and the discoverer of thallium, has found that "by the addition of a small quantity of the metal of sodium the sickening of mercury is entirely prevented, floured mercury is immediately brought together again, and the amalgamating action of ordinary mercury is greatly increased." Mr. Thomas Belt, who has experimented with sodium amalgam, at Mr. Crookes's suggestion, adds the following particulars:—"It is found," he says, "that a surprisingly small amount of sodium is sufficient to effect the clearing of fouled mercury. It will require a longer series of experiments than there has yet been time to carry out, to determine the smallest effectual proportion, but it has already been proved that one 20,000th part of sodium, added to the mercury is amply sufficient, so that this discovery has the great advantage of cheapness to recommend it. Sodium may even now be obtained in large quantities for 5s. per lb., and if a demand were to spring up for it, its price would be greatly reduced; but calculating at the present price of the metal, and using the quantity that experiments have proven to be amply sufficient for any description of ore, the cost is a mere trifle, in comparison with the advantage gained. With the ordinary amalgamating troughs used in mining, 120 lbs. of mercury are used to each set of four stamps, reducing 4 tuns of quartz in twelve hours; the cost would be less than 1d. per tun of quartz treated, which would certainly be more than covered by the loss of mercury prevented, without reference to the greater quantity of gold obtained, in consequence of the improved condition of the mercury" The sodium would seem to produce the beneficial effects thus indicated by virtue of its energetic power of reducing oxides and sulphides.

Interesting Experiments Upon the Auroral Current.

In the month of August, 1859, the beautiful phenomenon of the aurora borealis excited wonder and admiration in the minds of the people, both from the grandeur of the display and its effects upon the magnet c needle, particularly the electro-magnetic needle, with the coil of wire in the circuit of a telegraph line. In addition to the experiments made with the galvanometer at that time, several telegraph lines were worked, messages transmitted, etc., without the aid of artificial electricity, the aurora borealis assuming the entire duty of the usual batteries, and although the work was not performed as well as it might have been done with our usual battery power, without the aid or interference of the auroral current, yet it was a great satisfaction to many wonder-stricken telegraphers, who had never seen the like before.

Many of the effects of the phenomenon and accounts of experiments made upon telegraph lines were placed on record in the various newspapers at that time, some of which were also published in works on electricity and telegraphy. As the effect of the auroral current of Thursday, August 3, 1865, upon the electro-magnetic needle and telegraphic instruments differed considerably from that of August, 1859, we wish to place on record, for comparison with the previous experiments and for future reference, the result of comparatively rude observations, made with instruments, on a wire running from Boston to Springfield, Mass.

Although the auroral current was undoubtedly as powerful as that of August, 1859, it was observed that our wires were not so greatly disturbed by fluctuations (with our usual batteries on duty), but rather showed a weakness of currents, as though the batteries were not in proper working condition, while the effect in August, 1859, was to alternately and continually augment and decrease our battery currents, in consequence of the continual reversing of the polarity of the auroral current, thus making it exceedingly difficult to keep the instruments adjusted for the currents and rendering for a while lines almost useless.

In our experiments on the 3d instant we found, after removing the batteries, quite a powerful and steady current, each wave of which appeared of much longer duration, and the increasing and decreasing of the current more gradual, than was observed in August, 1859. But the most remarkable effect shown in our recent experiments with the galvanometer, was the almost entire absence of the changes of polarity, which were very marked in the experiments of 1859, each wave having been almost invariably succeeded by a wave of opposite polarity.

In the experiments of the 3d instant the positive polarity of the auroral currents was almost invariably west during the observations, which is the reverse of the usual battery currents on the Western wires, thus accounting for the weakness of currents observed previous to the experiments—as the two currents, being generally opposed, were partially neutralized.

The following observations of the needle will roughly show the power, constancy and polarity of the auroral current during the fifty minutes occupied by the experiments:—

The batteries having been removed and the galvanometer placed in the circuit of the wire extending from Boston to Springfield, Mass., at twelve hours fifty-one minutes P.M., a deflection of 3 deg. east was observed, the needle at the time gradually ascending. It should be remarked that a deflection in the needle east in this instance simply shows the polarity of the auroral current to have been the reverse of the usual battery current. After a comparatively steady upward movement of three minutes duration, with an occasional check or slight downward movement (a characteristic observable throughout the experiments), the needle remained stationary at 44 deg. deflection, but for only a few seconds, having descended rapidly to zero in the succeeding thirty seconds. After remaining quietly at zero one minute another ascent was commenced east, stopping at 28 deg. at twelve hours fifty-seven minutes thirty seconds, the duration of that ascent having been two minutes. Remaining at 28 deg. one minute, it descended to zero in one minute and thirty seconds, but immediately commenced another ascent in the same direction, reaching 60 deg. at one hour three minutes, this ascent occupying three minutes. The needle remaining steady at 60 deg. for three minutes,

when, during the succeeding minute, it ascended to 70 deg. and returned to 67 deg., where it remained two minutes. During the next succeeding minute it ascended to 72 deg., descended to 65 deg., and again ascended to 78 deg.

Remaining at 78 deg. two minutes, it commenced a descent occupying one minute, and remaining stationary at 38 deg. for thirty seconds, when it rapidly descended to zero, as if the current had been suddenly removed. Remaining at zero thirty seconds, another ascent was commenced east, reaching 50 deg. at one hour and sixteen minutes. During the succeeding minute the needle descended to zero, ascended three degrees, met and returned to zero. After remaining at zero one minute, an ascent west was commenced at one hour and eighteen minutes, reaching 34 deg. in thirty seconds. Remaining at 34 deg. one minute, it rapidly descended, as though the entire current had been suddenly removed. The needle then remained stationary at zero until one hour and twenty-six minutes, when it ascended five deg. east and remained between that and zero until one hour and thirty-three minutes, when it stood perfectly quiet at zero until one hour and forty minutes, at which time the observations were discontinued.

In order to give an idea of the comparative value of the auroral current during the above experiments, we would state that, with the same galvanometer, a battery with thirty-four cells in New York, with a resistance of No. 8 galvanized wire from New York to Boston, produces a deflection of 70 deg.—*Boston Journal, August 5.*

A DAY AT THE NARROWS.

There is probably no spot on the face of the earth that has experienced a greater change since 1630 than the island and bay of New York.

"Then all the broad and boundless mainland lay
Cooled by the interminable wood; and where yon bright blue bay
Sends up his willing waves to kiss his decorated brim,
And cradles in his soft embrace the gay
Young group of grassy islands born of him,
And, crowding nigh or in the distance dim,
Lifts the white throng of sails, that bear or bring
The commerce of the world, with tawny skin
And belt and beads in sunlight glistening,
The savage urged his skiff like wild bird on the wing."

There is probably no spot in the country where a more comprehensive idea may be obtained of the movement of the national industry than on this same bay. At 10 o'clock in the forenoon of August 5th, we stepped from Pier No. 4, North River, on board the *Naushon*, one of those white, fleet steamboats that give life to all American waters, and, fanned by the cool, delicious sea breeze, were borne swiftly southward through that busy scene which characterizes perpetually, day and night, without ceasing, the harbor of the commercial metropolis.

Immediately after leaving the wharf we passed through a fleet of naval vessels at anchor. A gentleman at our side pointed out the *Hartford*, the flagship of Admiral Farragut, the vessel of the most heroic achievements of any that floats upon the waters of this globe. Two years ago we saw her proudly steaming up through the Narrows, receiving and returning salutes from the forts and from the vessels of foreign navies, as she bore the old "Salamander" from the scene of his glory to the substantial rewards and the undying gratitude of the Republic. Then she was painted the lead color of the blockaders, but she is now glistening in a new coat of black, and presents the clean and trim appearance characteristic of men-of-war.

Not far from the *Hartford* was a French gunboat, with a curiously cut cap for her smoke-pipe, and otherwise loaded with ornaments. Near her was an American gunboat of about the same size, neat and snug like the Frenchman, but in her smooth, plain smoke pipe and entire absence of ornament, exhibiting that love of severe simplicity which marks the taste of American ship-builders—a taste that commands our highest admiration.

A little to the left, towards Governor's Island, was a large, dingy, dirty sailing ship, crowded with passengers, and bearing the English flag at the peak—manifestly an immigrant passenger ship from Liverpool.

A little further down the bay we met a large American propeller, also crowded with passengers, but these are men who are going to their homes. They are soldiers returning from their many marches and battles, and their final glorious triumph, to hearts that are yearning to welcome them, and to communities that will delight to do them honor, and which will transmit the memory of their services, with ever-increasing veneration and gratitude, from generation to generation.

On our swift way down the bay we pass several other steamers, besides large numbers of sloops, schooners, brigs, barks and ships, many of the sailing vessels in tow of those vigorous little screw tugs that are perpetually swarming all over the harbor. One of the steamers was a long iron ship propelled by a screw, crowded with immigrant passengers, and bearing a striped flag—we suppose of one of the German States. At the quarantine were a number of vessels with their flags in their shrouds, as a warning of their dangerous character.

After a run of seven miles we step on shore at Fort Hamilton. On the dock are five 15-inch guns, and a gang of men with a horse and windlass are slowly moving another up the sloping road towards its place in the battery. These are the last of the 31, the others being mounted on their iron carriages, each with its pile of 300 or 400 pound shells by its side. The 20-inch 1,000-pounder is also mounted on its iron carriage, and a pile of cast-iron globes, each weighing half a tun, are ready to be hurled through the sides of any hostile ship that may attempt to pass before its hollow throat. Across the Narrows, a mile away, is Fort Richmond, with its long lines of intrenchment, with the walls of the Water Battery glistening in white granite below, and the row of massive guns in Battery Hudson stretching away to the south. The old 64-pounders of this battery have been replaced by a large number of the heavy Rodman artillery, and, as we are looking, a flash rises from one of these, followed by the booming report and a great splash near a buoy in the water of the Lower Bay. The artillerists are evidently practicing to get the range of the new ordnance. After a few more shots some military officers near us remark that the distance is about two miles, and that the practice is very fine. We came to the conclusion that our warning given three years ago in regard to the light ordnance of the harbor forts is no longer needed, but that if the combined iron-clad fleets of England and France should attempt to force their way into this harbor, every vessel would be sent to the bottom.

Now, however, the scene is one of peaceful, though busy life. Far down towards Sandy Hook a long line of smoke is rising against the sky, showing that some bituminous-coal-burning steamer is coming in—doubtless a European steam ship just arriving from across the Atlantic. As far as the water can be seen from the neighborhood of New York City to the southeast horizon, it is studded with craft of various kinds—pilot boats with their huge figures painted on their sails, oyster sloops in large numbers, coastwise propellers of various sizes, white steamboats, and great ships—all coming and going perpetually—and they will doubtless continue to thus come and go through countless centuries.

The same swash and roar that here beats perpetually on the shore of Long Island is sounded along the coast from Cape Horn to Labrador. Beyond the south-eastern horizon stretches the Atlantic Ocean, a waste of waters, to the coast of Africa,

"At all times, calm or convulsed,
Icing the pole or in the torrid clime
Dark heaving, boundless, endless and sublime."

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Helix for Electro-magnets.—The helices which are generally used with electro-magnets are made out of a number of strands of wire, which is covered with silk or some other non-conducting material, and which is wound very close on a cylinder or roller of wood or other suitable material, and such helices really answer every purpose. They are not produced, however, without the use of covered wire, which renders them very expensive, and all experiments which may have previously been made for the purpose of producing a helix of naked wire, have proved abortive for want of the proper precaution in placing the several strands. It is obvious that when naked wire is to be used for a helix, the strands have to be so arranged that each convolution of the coil is perfectly and completely separated from the adjoining convolutions, in order to compel the electric current to travel through the entire length of the wire from which the helix is formed, and, notwithstanding it may perhaps have been tried before to accomplish this object, it is certain that hitherto no helix made of naked wire has been successfully used, and that no helix has ever been made of naked wire having each strand or convolution completely and perfectly separated from the other. Such is the helix which forms the object of this invention, and which has the naked wire, constituting its coil, wound in such a manner that each convolution of the coil is separated from the convolution adjoining it, in a radial direction, by means of sheets of paper placed between it and the adjoining convolution, and in a longitudinal direction, or in a direction parallel to the axis of the helix, by winding the wire so as to leave a space between the convolutions sufficient to cause the electric current to pass through the entire length of the wire. Dr. L. Bradley, of Exchange Place, Jersey City, N. J., is the inventor.

Gage for Quartering Cork.—In the manufacture of cork stoppers the cork is first cut into strips of the requisite width and thickness for the size of cork desired, and these strips are again cut up into cubical pieces, each just large enough to make one stopper. This last-named operation of cutting up the strips of cork is technically termed "quartering" corks, and it is generally performed by hand with a large and sharp knife. During this operation it is necessary to have the end of the strip of cork bear against a gage which is in the proper position to correspond to the requisite size of corks. In this invention the gage is made adjustable in a longitudinal and in a transverse direction, and the plug, against which the end of the strip of cork bears, is made adjustable and yielding in such a manner that when the main part of the gage is set a final adjustment can be given to the plug; and, furthermore, by having the plug yielding it is allowed to give as the knife passes through the cork, and the operation of cutting is considerably facilitated. John Power, of Boston, Mass., is the inventor.

Grease Cup.—This invention consists in the application of two valves, connected together by a jointed stem, which can be easily lengthened or shortened, in combination with two seats, one above and the other below the bulb or reservoir of the grease cup, in such a manner that, by turning the handle attached to the valve stem in one direction, the lower valve is closed and the upper valve opened ready to admit the lubricating material from the receiving cup into the bulb, and by turning said handle in the opposite direction, the upper valve is closed and the lower valve opened, and the interior of the bulb brought in communication with the steam cylinder or other device to be oiled. In order to allow the steam and air contained in the bulb to escape, when it is desired to introduce the lubricating material into the same, it is provided with a spring valve, which will open by a slight pressure of the hand, and when released, close by the action of a spring combined with that of the steam in the interior of the bulb. Gebhard Hagenmeyer, of Big River, Cal., is the inventor.

Jar for Well-boring Tools.—In boring deep wells, such for instance as oil wells, a device is connected with the drill or drill rod to admit of the drill, in case of the latter becoming fast, being subjected to a series of blows or concussions in order to loosen it. This device, commonly termed a "jar," is indispensable in boring deep wells, owing to the great difficulty which would be otherwise experienced in withdrawing or loosening the auger. The ordinary jar in use is attended with some disadvantages. It is liable to get fast itself, and is subjected to considerable wear in consequence of being in contact with the grit in the wall of the well. It is also liable to break or give way when worn, and the withdrawing it from the well is attended with considerable difficulty; these disadvantages, it is believed, are fully obviated by this invention. Miles Joy, of West Greenville, Pa., is the inventor.

Musical Instrument.—The object of this invention is to improve the valves of cabinet organs and other musical instruments. It consists in so constructing the valve that the face thereof shall be free to adjust

itself to the valve seat. It also consists in a peculiar mode of connecting the face of the valve to its stock or shank, whereby it can be removed therefrom and again replaced, merely by laying off the spring which holds it against its seat. George Woods, of Cambridge, Mass., is the inventor.

Machine for Tapering Spoke Tenons.—The object of this invention is to obtain a simple, economical and efficient device for expeditiously tapering the tenons at the inner ends of spokes, whereby the proper dish is given the wheel. The invention consists in the employment of a reciprocating cutter, working or moving in a right line in connection with an adjustable gage, to which the spokes are applied when their tenons are tapered; the above parts are used in connection with stops, and all are so arranged that the desired work may be expeditiously and accurately performed—far more so than can be done by the hitherto exclusive manual process or mode. Junius Foster, of Long Branch, N. J., is the inventor.

Correspondence

Cotton-picking Machines.

Messrs. Editors:—In your last issue you call attention to the importance of an invention for picking or harvesting cotton. I have had some experience in cotton culture, and from my own observation and the information gathered from others, I am firmly of the opinion that an economical machine which, with the same running expense, will perform four times the labor that can be done by hand, would be the most important invention that could be made at this time. Slaves were averse to using agricultural machinery, in fact, studied, "from the cradle to the grave, how not to do it."

But a new era has dawned. Slavery, with its snail-ish conveniences, is gone forever. And thousands of the hands that have heretofore picked the cotton in its season, and did little or nothing the balance of the year, will not be available hereafter. For if the negro is really free, he has the same right that any other freeman has to support his wife and children, without their being compelled to work in the field. Thus, gradually, the old source of extra hands for picking will be withdrawn. Now, in Illinois, three men, with six mules or horses, can cultivate 100 acres of corn; they commence plowing in April, and lay by their corn in July, doing the work in three months. Then the same force ought to be able to cultivate an equal area in cotton, with the same labor-saving appliances, in six or seven months—as they can break cotton ground in December or January, and lay it by in July. It is computed that one person will pick, by hand, from 6 to 10 bales of cotton. The average yield on the bottom lands of the Mississippi is one bale, of 400 lbs., per acre. Then, if three men can cultivate 100 acres, there must be some labor-saving invention to enable them to pick 100 acres, or here is a check on the expansive energies of our nation. If the country must support three or four times the number of inhabitants that are required to till the soil, simply in order to have the necessary force at hand to harvest the crop, then truly there is one spot where labor-saving agricultural implements are at a discount, because it would be better to have all the inhabitants constantly employed than loafing around while improved machinery did the work they could do in the old-fashioned way, quite as well as they could pick the crop. Therefore, in my opinion, for the quickening of the enterprise of the cotton region, and the general advantage of the people thereof, and the certainty of an independent fortune to the inventor, there is no invention so much wanted as a practical cotton picker. It would add at least one-half to the producing force of the cotton country.

Carroll.

New York, Aug. 3, 1865.

A Huge Boiler of Platinum.

Messrs. Editors:—I notice on page 82, current volume of the Scientific American, a paragraph stating that the new apparatus of Messrs. Crosse & Blackwell, London, for boiling vinegar, is "aluminum;" I think it was intended for "platinum." I have the pleasure of inclosing you a sheet giving a few items in reference to the apparatus. It may interest our pickle men. As a matter of interest to another trade, I may mention the use of platinum crucibles instead of clay, at the great glass factory of St. Gobain, France, by M. Pelouze, in order to obtain the purest possible glass, free from the yellow tinge which has been so difficult to banish from clear flint glass. He uses amorphous and pulverulent phosphorus, in place of charcoal, in the mixture.

H. M. Raynor.

No. 748 Broadway, New York, Aug. 5, 1865.

[The platinum steam coil referred to in the above letter, is made of pure platinum tubing, proved at steam pressure of 60 lbs. per square inch. Its value is £800, or $4,000; and was manufactured for Messrs. Crosse & Blackwell, and used by them for boiling their pickling vinegar. The coil is the first of the kind that has been made; it boils 325 gallons of vinegar—the capacity of the vat—in an hour and a quarter, with steam at 30 lbs. pressure. It is made of pure platinum, autogenuously soldered. The length of tubing (an inch and a half in diameter) consumed being 32 feet, and was manufactured by Messrs. Johnson Matthey & Co., England.—Eds.

Breech-loaders Triumphant!

Messrs. Editors:—When I began my crusade in favor of the adoption of breech loading fire-arms, in 1861-2, you will recollect that the subject not only met with the serious opposition of men in authority, but that it was absolutely treated with contempt by many, and my efforts were denounced as fanatical and in bad taste.

Well, since then the French Government has adopted them for its entire army; the English Government has advertised for proposals for changing all its guns to breech-loaders; our own Government has adopted them; and herewith I send you the circular of the Swiss Consul-General, inviting breech-loaders for trial, in order to secure the best for its army. So the world *does* move in spite of the old "fogies." Whose turn is it to laugh now?

It may not be generally known, but is a fact, that several, if not all the European governments have agents in this country looking up our improvements in fire-arms and other warlike implements. The recent war has opened the eyes of other parties besides John Bull, and the sequel is one of which our inventors may well feel proud, for all this is the direct result of their skill. The bravery of American soldiers and the skill of American inventors have secured for us a character among the nations of the earth which politicians and so-called statesmen could never have secured. It is a national compliment that our sister Republic should come here to select the best arms for her army, and one of which our inventors have a special right to feel proud.

W. C. Dodge.

Washington, D. C., August 1, 1865.

Patent Sale Agency.

Messrs. Editors:—I saw in a recent issue of your journal an article entitled the "Defense of Patent Sale Agents," written by Mr. J. H. Beardsley, who, I must confess, takes the part of the agent very much like a man of sense, and I am very much obliged to him for his kindness in so doing; for he, in doing so, vindicates my cause as well as his. I saw the article he refers to and felt somewhat indignant at the spirit in which it was written. If the gentleman who wrote the first article will come to my office I will show him that patent agents are not all dishonest. I consider his article a slander not only upon Mr. Beardsley's business but upon mine, and every one who has anything to do with the sale of patent rights. He should be more careful and inquire into the business before he passes his opinion in such sweeping and public terms. If any man comes to me, and if, after full explanation of my terms, is not satisfied, he can go his way and I'll go mine. I have had no complaint yet, and do not anticipate any.

J. C. Davis.

Newark, N. J., July 28, 1861.

Lee's Fire-arms Company

Messrs. Munn & Co.:—My subscription to your valuable paper having expired, I asked some of my workmen if they wanted to benefit themselves $25 per annum (and they are careless readers that can't do that), myself $500, and another party about $10. I admit the motive a selfish one, but, knowing your generous disposition, you will overlook that. I only wish manufacturers would look at it even in a dollars and cents light. In response, I send draft for ten copies of your paper from the beginning of the present volume, to be addressed to this office. Being the only establishment of the kind in the West, it is a pleasure for me to say that the rifle we are making was patented in 1862 through your very successful Agency. Our sporting rifle is much thought of by Western hunters, and they are a fastidious class. We are also finishing a contract for Government of carbines.

James Lee.

Milwaukee, Wis., July 31, 1865.

[We thank Mr. Lee for his generous appreciation of the value of our journal. We take this occasion, also, to thank our patrons for their efforts to increase our circulation. At the beginning of the present volume, with a view to encourage our readers to organize clubs, we decided to reduce our terms of subscription to $2 50 per annum for all clubs of ten or more names; this reduction has resulted in bringing us a large number of clubs. There is, however, room for more, and we hope there are hundreds of others who will now avail themselves of our liberal clubbing terms.—Eds.

Why Plated Goods Tarnish.

Messrs. Editors:—In No. 2, present volume of the Scientific American, a correspondent inquires why electro-plated wares tarnish sooner under the same circumstances than solid silver articles. You answer him by stating, "It doubtless arises from imperfect cleaning of the electro-plated articles," and also state, "it is well known that the solution adheres, and cannot be removed by mere washing." Your explanation is correct to a certain extent. Careless and slovenly platers do leave some of the solution remaining in the pores of the metal—a very little of which does mischief. But good first-class platers remove all the solution, so there is seldom if ever any trouble from this source in really first-class goods.

The real and principal cause is this, viz.: In electro-plating pure silver is deposited on the article plated, and when removed from the solution the silver is in a soft, porous state. Passing the finger over the surface it feels like velvet. The microscope shows the spongy texture perfectly. If there is a thick deposit it is very difficult to compress and solidify the silver in burnishing, which leaves the silver more or less spongy. This is especially the case with goods plated on soft or britannia metal, as the metal under the silver yields under the pressure of the burnisher and fails to produce so solid and compact a surface as can be obtained on hard metal goods or solid silver. Now it is well known that a polished surface of pure silver is one of the most sensitive metals known, to the action of the various gases, moisture, etc., which prevail at almost all times and places; hence if these articles with pure silver surfaces, and those surfaces soft and more or less spongy, are exposed to the atmosphere for any considerable length of time they will be promptly acted upon by these agents, and tarnish. Solid silver articles have the advantage of at least ten per cent alloy—a very great protection against tarnishing; besides, these articles are drawn under the hammer and are as hard as the silver can be worked, having often to be annealed while in process of making. The surface is made very smooth, after which it is carefully burnished by a strong hand, which leaves the surface as smooth, hard and compact as is possible, which, with the alloy, is the great secret why it is less susceptible to tarnish than plated wares. Some of the finest qualities of goods, plated on fine German silver, can be finished so as to keep their color nearly as well as solid silver. The above is the result of ten years' experience and observation in the manufacture of plated wares.

If you think it would interest your readers I could give the best modes of preventing and removing tarnish on plated and solid silver wares.

E. W. C.

New York, Aug. 2, 1865.

[We should be pleased to receive the directions.—Eds.

Important to Manufacturers of Fire-arms.

The following circular is addressed to manufacturers of breech-loading guns, and will explain itself on perusal:—

CONSULATE-GENERAL OF SWITZERLAND,
WASHINGTON, D. C., July 26, 1865.

SIR:—Your attention is invited to the inclosed circular of the Honorable War Department of Switzerland inviting competition in breech-loading fire-arms suitable for infantry service. As a considerable portion of the circular is devoted to technical points, intelligible only to those familiar with the fire-arms now in use in Switzerland, I would here extract from the circular in question the essential points of interest for the manufacturer of arms in the United States. The main object of the prize offered by the military authorities of Switzerland appears to be to secure the best system of breech-loading arms which could be adapted for the use of infantry. It is stipulated that metallic percussion cartridges are to be used, and the barrel of the arm is to be connected securely with the stock, and not require to be moved when loading. The further stipulations named in the circular are as follows:—

9. The outward shape of the arm shall not present any obstacles which might prevent its easy handling.

10. The ignition of the charge shall be perfectly regular and sure.

11. The arm shall possess all the important advantages of a breech-loading weapon, such as simplicity, durability, solidity and strength of mechanism, facility of handling it after long-continuous firing, and to be easily cleansed and kept in good order, especially as to the complete and durable closing of the breech.

12. The War Department of Switzerland invites manufacturers of arms, and inventors who may be disposed to submit models of arms which will comply with the required conditions, to make their proposals at the earliest date.

13. The time appointed for the delivery of the arms to be tried ends October 1, 1865.

14. A special officially selected commission will examine the various models, experiment with them, and ascertain their efficency.

15. The Government of Switzerland has decided to award to the inventor of a system or style of breech-loading fire-arm which can be introduced and adopted into the Swiss army, a premium of 20,000 francs.

16. In case that no model should be submitted which answer all the requirements mentioned, the Government reserves the privilege to divide, wholly or partially, the stated amount among those who have forwarded the most effective models of the arm.

Should you desire to compete for the prize offered, and thereby perhaps succeed in introducing your system of breech-loading fire-arms into the Swiss service, it will secure to your arm a most enviable reputation; for no manufacturers of arms on the continent of Europe are more expert than the Swiss, and no government is known to devote more zealous and discriminative attention to the introduction of the best fire-arms into the military service.

Arms intended for competition should be well packed, and provided with at least one thousand rounds of cartridges. They must be sent to this Consulate by the 1st of September, and all expenses of shipment from Washington to Switzerland will be borne by the undersigned. If desired, after trial, the unsuccessful arms will be returned free of charge, or purchased, if a price can be agreed upon. Full description of each arm should accompany it, and also the price at which the arms could be furnished per piece or by the quantity.

JOHN HITZ,
Consul-General of Switzerland.

The First Defect in the Cable, and How it was Repaired.

The following interesting account of the first accident to the Atlantic cable is given by a correspondent of the *London Times*, writing from Valentia, July 27, 1865:—

At last the mystery of the breakdown of the cable is known in all its details. The master of the *Hawk*, which returned here this evening, having left the great ship last night, brings full particulars, both of the extraordinary nature of the accident and the still more curious manner in which it was discovered, its place ascertained, the cable hauled in and the piece cut out. When about eighty miles off land, with dead calm weather, the ship going six knots, and the cable, we are told, running out as softly as a "silk rope," the usual test signals were being sent through, when suddenly both those to and from the shore gave most serious indications of faulty insulation. The utmost alarm was felt on this discovery. The connections of the instruments were cartully re-examined and the most rigid exactness observed in the final tests. All gave the same result, and what was a still more certain and ominious proof, the return currents from Valentia showed an equal loss. Notice was instantly given to Mr. Canning and Captain Anderson, and the speed of the *Great Eastern*, which was then in 300 fathoms, was reduced almost to a standstill. It must be remembered that all these signals were sent and received through the whole length of 2,300 nautical miles, or about 2,700 statute miles of wire.

LOCALIZING THE DEFECTIVE POINT.

Valentia was instantly communicated with, and the whole electrical staff under Mr. De Sauty set to work to ascertain by resistance tests whether the fault was in the ship or in the eighty miles that had been paid out. Trials of so delicate a nature and of such vital importance to the success of the undertaking were, of course, conducted with the most vigilant caution, and the calculations based upon their data made and re-made to insure certainty. The result of all was a unanimous decision that the fault was not on board, but in the eighty miles of submerged wire. When this decision had been arrived at, the cable was at once cut on board the *Great Eastern*, and the length under water tested by Mr. Saunders. With wonderful skill his tests at once "localized" the spot where the fault existed—eleven miles from the stern of the ship, and within a quarter of a mile from where it actually was.

WINDING IN THE CABLE.

Instantly preparations were made for getting the *Great Eastern* round and employing the winding-in apparatus fixed forward specially to be used in case of such mishaps. It was hoped, of course, that its use would never be required, and very many believed that, whether required or not, it would never accomplish what it was intended to achieve. The result proved the fallacy of both hopes and fears. The severed portion of the cable was passed into this machine, and, the *Great Eastern* steaming back over the rope's course, the work of reeling-in at once began. The cable came up with singular ease. The strain on the dynamometer of the machine never exceeded eighteen hundred, which was nothing to a cable guaranteed not to break under seven tuns, and equal, from its specific gravity, to support eleven miles of its weight in water, or through a deeper sea than soundings have ever yet been found in the world. As we have said, within a quarter of a mile of the spot indicated by Mr. Saunders the fault was found; and nothing can more strongly indicate the endless perils with which successful submarine telegraphy is beset than the trivial and almost unavoidable accident which had caused it.

THE ORIGIN AND NATURE OF THE DEFECT.

As the lengths of wire of one hundred or one hundred and fifty miles were manufactured at Messrs. Glass & Elliott's, they were taken down in barges and coiled away in the tanks on board the *Great Eastern*. Each as it arrived was, of course, spliced up to that which had preceded it, and this was often done in the tanks themselves. The operation of splicing not only means joining the conductor, but also joining the outside wires, the junction of the latter being made at different lengths—the bits of wire cut out being thrown away. It seems, however, that one of these atoms of wire, about two inches long, and as thick as a stout darning needle, fell on the coil unnoticed, as, indeed, who would notice it, or for a moment think of the consequences which this disregarded presence in such a spot might surely occasion? The weight of the layers of cable laid above this fragment—as insignificant as a shaving in a carpenter's shop—pressed it firmly into the tarred hemp which forms the outside coverings of the cable. To this it adhered. While in the tank it did no harm, but when this portion came to be paid out the small diameter of the eight leading wheels which give access to the paying-out machine, and the weight of the jockey pulleys over those which keep the rope in its place, bent the stout iron wire so sharply that it passed between the hemp, pierced the gutta-percha through at least two or three of its four folds, and there remained. In this state it was found, and instantly recognized as a piece of wire from a splice joint.

HOW IT WAS REPAIRED.

A short length of cable was at once cut out, a new splice made, vigilantly tested, and gradually sunk. When on the bottom it was again retested for some hours, and the signals were shown to be absolutely pertect.

HOW THE "GREAT EASTERN" BEHAVED DURING THE TIME.

During all this time the *Great Eastern* remained quietly hove to. The sea was calm, and even the throbbing swell of the Atlantic had died away into the mere undulations of a wave. The motion in her, therefore, was barely perceptible to the feeling, and could certainly not be detected by the sight, save by watching the little arc of a circle which her topmasts now and then described. The whole accident caused a delay of nearly twenty-four hours, during which the drift of the vessel was almost nothing.

SPECIAL NOTICES.

Jacob Constant, administrator of the estate of Isaac Constant, deceased, of Dawson, Ill., has petitioned for the extension of a patent granted to him on the 4th day of November, 1851, for an improvement in cultivators.

Parties wishing to oppose the above extension must appear and show cause on the 23d day of October next, at 12 o'clock, M., when the petition will be heard.

Thos. J Sloan, of New York City, has petitioned for the extension of a patent granted to him on the 21st of October, 1851, for an improvement in machinery for shaving, nicking, and re-shaving wood screws.

Parties wishing to oppose the above extension must appear and show cause on the 2d day of October next, at 12 o'clock, M., when the petition will be heard.

Wm. Kenyon, of Steubenville, Ohio, has petitioned for the extension of a patent granted to him on the 14th of October, 1851, for an improvement in machines for making nuts, washers, etc.

Parties wishing to oppose the above extension must appear and show cause on the 25th of September next, at 12 o'clock, M., when the petition will be heard.

Louis S. Robbins, New York City, has petitioned for the extension of a patent granted to him on the 4th day of November, 1851, for an improvement in lubricating oil from rosins.

Louis S. Robbins, New York City, has petitioned for the extension of a patent granted to him on the 4th day of November, 1851, for an improvement in distilling acid and naphtha from rosins.

Louis S. Robbins, New York City, has petitioned for the extension of a patent granted to him on the 4th day of November, 1851, for an improvement in tanner's oil from rosins.

Newton Foster, Gilbert Jessup, Hiram L. Brown and Calvin P. Brown, of Palmyra, Chapinsville, and Shortsville, N. Y., have petitioned for the extension of a patent granted to them on the 4th day of November, 1851, for an improvement in seed planter.

Parties wishing to oppose the above extensions must appear and show cause on the 23d day of October next, at 12 o'clock, M., when the petition will be heard.

THE New England Agricultural Society will hold its second annual fair at Concord, N. H., on the 5th, 6th, 7th and 8th days of September next. The society offer the large sum of eight thousand dollars in premiums. Among the novelties to be exhibited will be a locomotive steam plow, invented by a New England mechanic.

MISS MARIA MITCHELL, of Nantucket, Mass., is to be Professor of Astronomy at the Vassar College, Poughkeepsie, N. Y., which is to be opened in September. Miss Mitchell has a world-wide reputation among astronomers.

IMPROVEMENT IN ELECTRO-MAGNETS.

Dr. L. Bradley, of No. 7 Exchange Place, Jersey City, N. J., has just obtained, through the Scientific American Patent Agency, a patent for an interesting and important improvement in electro-magnets.

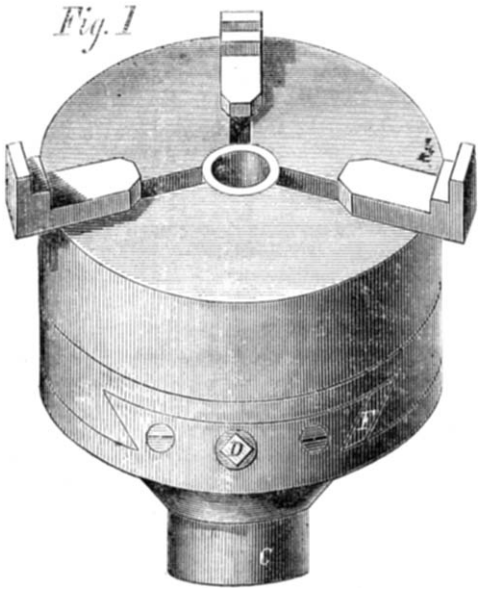
An electro-magnet is a rod of pure, soft iron, around which is wound, in spiral folds, an insulated wire; so long as a current of electricity is passing through the wire, the iron core is a magnet, but the instant the electro-current ceases, the iron loses its magnetism. The power of the magnet with currents of given strength is in proportion to the number of convolutions in the surrounding wire, and to their proximity to its surface. Dr. Bradley conceived that both these might be increased by using a naked wire in place of those covered with silk or cotton thread, which are usually employed, separating the several layers from each other by thin sheets of paper, and trusting for insulation to the dry air between the convolutions. Magnets made in this way request, of course, that the wire should be very carefully laid, so as to make the space between the folds of perfect uniformity

For the last four years Dr. Bradley has been manufacturing magnets in this way for telegraph instruments, and they have met the general approval of operators. He has just shown us two spools—one of naked wire, and the other of wire insulated with silk, and made, as he says, of wire of the same size and length, or, at all events, of the same resistance, as measured by the rheostat—each being of No. 30 wire, and having a resistance equal to that of 4¼ miles of No. 8 galvanized wire—the standard in use for telegraph lines. The spool of naked wire is 1 inch in diameter, and contains 3,256 convolutions, while that of insulated wire is 1⅜ths inch in diameter, and contains 2,912 convolutions, showing a larger number of convolutions, and greater proximity in the naked wire, with a corresponding increase in magnetic power for a given resistance. The outer and inner layers are fastened by gum-shellac, and Dr. Bradley says the wire is never shaken or jarred from its position.

KING'S LATHE CHUCK.

This modification in the chuck for lathes is intended to facilitate setting irregular forms, such as eccentrics

Fig. 1

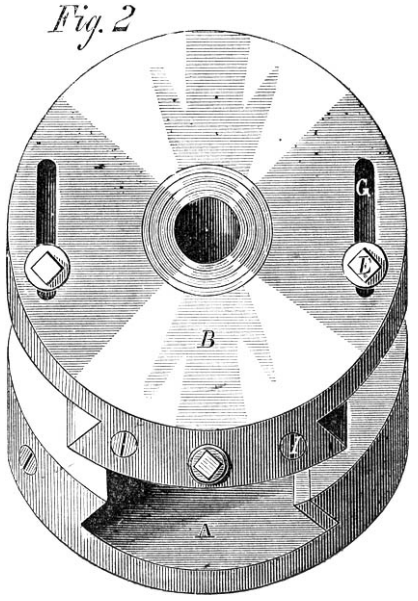


or cams, and it is to be applied particularly to scroll chucks, which are arbitrary in their motions and cannot be set out of the center unless one of the jaws be taken out and started on the thread after the other jaws have been run in one turn or two. Even this will not always bring the work true, and some simple arrangement of the kind here shown will prove a great convenience. The details are as follows:—

A is the plate, which is fastened securely to the main chuck, forming a part thereof, into which the dovetail projection of the plate, B, slides; C is the hub, which screws on the lathe spindle; D is the screw, by the use of which the chuck may be adjusted to any required position with the spindle of the lathe. The face side of the dovetail projection is laid off to fractional parts of an inch, and marked with figures, so that there is no difficulty in setting the work accurately. The screws, I, hold the piece to which the screw, C, is secured firmly to the plate, B. F is the gib, which is tightened up as it wears, by screws, as usual. G G (Fig. 2), are slots through which bolts, E, pass, for the purpose of firmly securing plate, B, to the chuck, A, at any desired point.

The utility of this improvement is universally conceded by all first-class machinists who have seen it, and the proprietors of several of the largest and best machine shops have already expressed a wish to adopt it in their own workshops. This attachment may be applied to any size or kind of chuck already in use,

Fig. 2



equally as well as to new ones, and will add only from one to one and a half inches to the depth of the entire chuck, including the attachment. Although only one sliding plate is represented in this engraving, says the inventor, another slide can be added if necessary.

For further particulars address the inventor and patentee, W. Haskell King, 561 River street, Troy, N. Y., by whom it was patented, through the Scientific American Patent Agency, on April 25, 1865.

IMPROVEMENT IN THE DISTILLATION OF PETROLEUM OIL.

On page 112, Vol. XII., Scientific American, we have already described the method and still in general use for refining petroleum oil, by which it will be perceived that a proper distillation can only be obtained when the heat used is perfectly controlled by the operation. The most careful management is required to prevent burning the oil or the still, and if the crude article is allowed to boil too rapidly heavy gases are generated, which will not pass through the pipe leading into the room or condenser, but fall back into the still and incrust it with tar and coke. These incondensable gases, mingling with the oil vapor, also materially affect the color of the distilled article and convert it into an inferior illuminating oil.

In distilling petroleum, the profit of the operation depends very much upon the economy of fuel, and the time required for running off a "charge," and resuming operations with the same still. An ordinary still, having a capacity of one thousand gallons, will require nearly one tun of coal. The boiling point is reached in about four hours, and the "charge," is distilled in from 36 to 48 hours. From four to six hours are subsequently lost in cooling the still for the purpose of removing the tar and coke that has been formed during the process of distillation.

The merchantable product of one thousand gallons of crude oil refined, according to the above method, is as follows :—

Illuminating oil, 65 per cent; naphtha, 15 per cent: tar and coke, 12 per cent; gases, loss, evaporation, 8 per cent.

From this it appears that about twenty per cent of the material is either lost or converted into substances of little value to the refiner.

In August of last year George H. S. Duffus obtained a patent for a still designed to overcome all the difficulties above described. One of these stills has recently been put in operation at the refinery of Messrs. Buckhout & Roberts, at the foot of 106th street, E. R. (Harlem). and others will soon be supplied. It is built entirely of wrought and cast iron; requires no brickwork or chimneys; can be easily transported to any part of the United States, and set up within 24 hours after arriving at its destination. The heat is completely under control of the most ignorant operator, and, within one hour after the fires are lighted, the distillation commences. The heat can be readily raised to any required temperature and retained at a uniform point until the whole charge has been distilled; then this still can be immediately refilled, and the new distillation commenced, without any material loss of time or heat, for cleaning purposes. Less than two dollars' worth of fuel is required for each charge of oil, which is run off in from 24 to 30 hours. No coke or tar is deposited, and the only residuum yet discovered, after many distillations is about three per cent of heavy oil, which is redistilled and converted into lubricating oil. One thousand gallons of crude oil, refined in the Duffus still, gives the following product:—

Illuminating oil, 80 per cent; naphtha, 15 per cent; heavy oil, 3 per cent; loss (watery evaporation), 2 per cent.

With this improved still, every valuable constituent of the crude oil is obtained in some merchantable form, a result that cannot fail to commend such an invention to the attention of refiners and others interested in distillation. The illuminating oil produced is equal to the best in the market, and exceeds the Government fire test of 115°

KELLY'S BIT FASTENER.

It is very annoying, when withdrawing a bit after a hole has been bored, to have the tool part company with the brace, so that it has to be replaced for every operation. Where many holes have to be bored this

Fig. 2

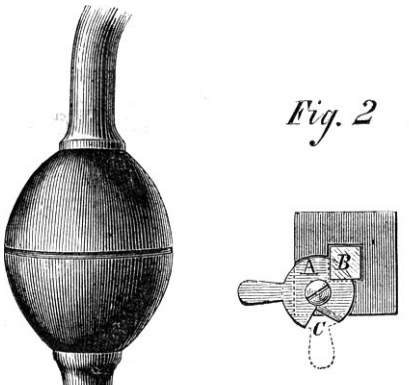
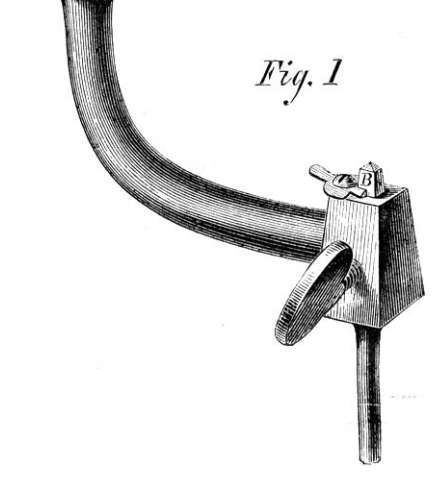


Fig. 1



becomes a serious hindrance, and many plans have been devised to prevent it.

The one here illustrated is a very efficient device for the purpose. It consists simply of a cam-shaped slide, A, fitting in a notch, B, cut in the upper end of the bit shank. By turning the slide so that the notch, C, comes round, the bit can be taken out. The engraving shows the manner of using it very clearly, and it will be seen that it can be applied to any brace at a trifling cost. New goods now in stock can be fitted with this appliance in a short time.

It was patented through the Scientific American Patent Agency by Daniel Kelly, of Grand Rapids, Mich., on Dec 16, 1862. Address him at that place for further information.

THE

Scientific American.

MUNN & COMPANY, Editors & Proprietors

PUBLISHED WEEKLY AT

NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

☞ Messrs Sampson Low, Son & Co., Booksellers, 47 Ludgate Hill London, England, are the Agents to receive European subscriptions for advertisements for the SCIENTIFIC AMERICAN. Orders senton them will be promptly attended to.

☞ "The American News Company," Agents, 121 Nassau street, New York.

VOL. XIII. NO. 8...[NEW SERIES.]....*Twentieth Year.*

NEW YORK, SATURDAY, AUGUST 19, 1865.

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TRANSATLANTIC STEAM COMMUNICATION.

Great activity is manifested in Europe over the establishment of new steamship lines to compete for the carrying trade between the two continents. In addition to the vessels already running, there are new ones building which are intended to be first-class in all that relates to speed and capacity.

The Hampshire (England) *Independent* of a recent date says that a company, long-projected, is about to go into active operation with new ships, between New York and Liverpool. The alliance is called "The Imperial Transatlantic Steam Company," and the steamers are to be 4,000 tuns burden. In addition to this line others, already in working order, are extending their operations, adding to their fleets, and remodeling them, so that every thing necessary to success will be insured so far as human foresight can go.

The French line recently established, running the *Washington* and *Lafayette* to this port, is, or was, worked by an English company, and called at a French port only incidentally on the outward and return trips. These ships are to be taken off and their places filled by others (worked by a French company) better fitted for the service. It is no v intended to put on not less than five first-class screw ships—the *Europe*, *Napoleon III.*, *St. Laurent*, *Pereire*, and *Ville de Paris* They are to run fortnightly, and will receive a liberal subsidy from the French Government. Thus it will be seen that, although the communication between the New World and the Old is already well provided for, in the view of disinterested persons, other ships and other lines are starting up, wi h large capital, determined to succeed in their enterprises.

While this activity is taking place abroad very little is being done here. There are no new steamers on the stocks, no engines for them in the machine shops. If any are projected they have been kept very secret, for we have not heard of them.

On Saturday, the 19th inst., the steamer *Circassian*—a British-built vessel, captured while running the blockade—is to be dispatched by Messrs. Leary, of this city, to Bremen and Southampton, as a pioneer ship, in a new effort to give our steam vessels and shipping interests their proper place on the seas. With this, and a rumor that the *Fulton* and *Arago*, of the old line to Havre, are to be re-established, there are no signs of vitality among our shipping merchants on what is a most important subject. So far as ships are concerned, we have them, or can have them, on proper notice, either of iron or wood, as is deemed most suitable; either screw or paddle propeller, as is thought best. The engines can soon be fitted up, for Government contracts are ended, and the machine shops are almost idle. All that is wanted is the word from the owners, and the keels would be laid and the bed-plates cast.

The always-to-be quoted "Collins Line" was the only national one we ever had worthy of the name, and its ships were efficient ones. We can build better and faster ones at this period, but their engines ought not to be ponderous and complicated side-levers, that are forever getting out of line, forever having hot brasses, and in chronic difficulties with broken shafts.

The *Re d'Italia*, built by William H. Webb, Esq., for a war vessel, can make ten or twelve miles easily, as a regular duty, in decent weather. She went from this port to Naples, Italy, a distance of 4,920 miles, in 400 hours—or an average speed of 12 miles an hour all the way over. She is a full model, heavily rigged vessel, with great carrying capacity, and is, moreover, an iron-clad screw ship. With such improvements in her model as her talented designer well knows how to make, a vessel of this class would be a magnificent ocean trader that would challenge the best efforts of foreign ship-builders.

What is wanted, we presume, is a reasonable assurance that a new line "will pay." Men, however patriotic, will not subscribe for stock on national principles, unless they are certain of getting the full value of their investment. This can only be met by the suggestion that if Englishmen can build ships in England, and run them at a profit, Americans ought to build ships in America and make a good thing out of it. Giving Britannia to understand that she does not always rule the waves, is very nice, and easily done at a yacht race, but to keep up a line of steamships at a loss, solely to show the world what smart mechanics we are and what enterprising capitalists we have, is something that won't be done in a hurry.

We sincerely hope the day is not far distant when, as of old, our steamers shall be upon the ocean again. With the experience gained in past years, our shipbuilders can design models which shall leave foreign builders far behind, and it only requires some energy among capitalists and ship owners to begin at once.

HOUSES FOR MECHANICS.

It is one of the social evils of large cities that dwellings for persons of small means are not to be had. There are none who feel this more keenly than mechanics. After toiling hard all day in the noise and clatter of the factory, they need a clean and quiet home to refresh them for the labor of the day coming. But, in New York, and in most large cities, this is a thing unattainable. Every mechanic who desires to live comfortably pays rent far beyond his means; or, if he chose the other alternative—a low rent—he must put up with quarters unfit to stable a horse in. We speak advisedly. No man can afford to pay more than one-sixth of his income for rent, and the laboring man cannot spare that even. Consider $2 a day the average wages earned by mechanics, and we shall find that for $100 per annum there are no accommodations fit to be called such. The only places offered are crowded rooms, high up above the street, and reeking with vermin and stench.

The attention of capitalists, and philanthropists generally, has been frequently called to this subject, and many projects have been started to ameliorate the evils complained of. Not one ever succeeded. The reasons are plain. In one case, a plausible scheme was planned, which was to erect a large building in the suburbs, where, under one roof, all things necessary were to be had at a moderate price; such as gas, baths, washing apparatus, sun-light, ventilation, and good order. This was encouraging, but, inasmuch as the projectors required workmen to come forward and subscribe for about $1,000 worth of stock each, it is needless to say it fell stillborn.

By a recent issue of the *Evening Post* we learn that another plan is about to be tried. It is called "The Home-building Association," and is composed of the solid men of the city. Among them are Messrs. Lenox, Aspinwall, Russel, James and Ketchum. They propose to build houses and sell them at the actual cost and interest, and have contributed a large sum for this purpose. They have purchased a lot of ground in Williamsburgh, L. I., at the corner of North Eighth and Ninth streets, on which they have now in process of completion six buildings. We quote:—

The plot of land at present owned by the company is two hundred feet square. It fronts on both North Ninth and North Eighth streets. Twelve houses will be built on each of the streets, making twenty-four in all. The width of the lots is sixteen feet eight inches, and their depth seventy feet, leaving a space between the two rows of houses sixty feet wide by two hundred feet long. This space it is intended to preserve as a private playground for the children of the occupants of the dwellings that border on it.

The houses are thirty feet in depth, and are built of a good quality of brick; they are two stories high, with flat roof and basement and cellar. They are so divided that the upper floor has three rooms with closets; two of the rooms in back and one in front. The front room is large, occupying the whole width. The first or parlor floor has two rooms. The hall, which is comparatively large, divides them, but does not extend from the front to the back of the house—it having been so arranged that the stairs leading to the second story and to the basement are in the middle of the house, and run transversely. By this plan a large back parlor is secured; and the front parlor or reception room is also of good size. The basement story comprises cellar and kitchen; these have many conveniences.

The houses will be finished in a plain, substantial and neat manner. The walls are eight inches in thickness, and are well built. The inside work will be tasteful. Cornices and center pieces will ornament the parlors, and the walls and ceilings are to be "hard-finished." Gas pipes are laid in every room, and Ridgewood water is introduced into each cellar.

It is impossible not to wish this scheme to succeed, but, we fear it is a dead failure. Such houses as are described above could not be built now for less than $3,500 or $4,000, and, unless two families are to occupy them, no advantage will be gained, for no mechanic, and but few professional men, can afford to live in them. To pay a rent of $300 one must be in receipt of at least $1,500; and if, in addition to this, we consider the car fares and ferryage, it is easy to foresee that the plans of these benevolent gentlemen cannot succeed. Therefore, the laboring man is no better off than before.

The obvious and only remedy is to build houses where four or six families can live under the same roof. A multitude gathered together do not necessarily generate filth and create dissension, unless there be unworthy members. So, if such dwellings were guarded by porters or janitors, whose special business it should be to see that the several floors were kept clean, the entries tidy, and the water privileges and property generally well treated, we should have dwellings that could be let reasonably, and which would contain all the comforts requisite.

Various improvements could be introduced with economy. The landlord should heat the whole house and light it for so much a month. A furnace in the cellar would do the first, and the gas would perform the latter. Only fuel sufficient for cooking would have to be carried up stairs, and the dust and dirt thus saved would be an item.

We are firm in our faith that workmen can have much better dwellings at a lower price than those mentioned above, and we shall be glad when some promising project appears.

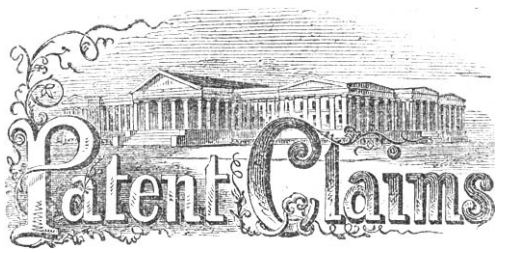
The "Dictator."

The *Dictator* and *Agamenticus*, which left this port on Tuesday morning, Aug. 1st, had an exciting race after they got outside. They finally arrived off Portsmouth harbor, the *Dictator* forty minutes ahead, notwithstanding the bursting of a tube in one of her boilers, which rendered it for the time comparatively useless. The *Agamenticus* also claims to have been under some disadvantages, owing to bad coal, etc. From Portsmouth to Portland the monitors will have another trial of speed, and the friends of the *Dictator* believe that within that distance she can beat the *Agamenticus*. The *Dictator* is said to have worked admirably on her passage round to Portsmouth.—*Boston Advertiser.*

[The *Agamenticus* is a naval-built vessel, iron-clad, with a revolving turret on Ericsson's plan.—EDS.

THE Thirteenth Annual Indiana State Fair will be held in Fort Wayne, commencing on Monday, Oct. 2d, and closing on Saturday, the 7th. The secretary's office will be open at Fort Wayne, for entries in the several classes, on Monday, September 25th.

AT a Russian industrial exhibition, recently closed, there was a large portrait of Peter the Great, made up of many colored lucifer matches, contributed by Warsaw firm.



ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING AUGUST 8, 1865.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

49,209.—Manufacture of Paper.—J. W. Allen, Marion, Mass.:

I claim the described new article of manufacture.

49,210.—Pencil-sharpener.—H. P. Andrews, Cleveland, Ohio:

I claim, First, A pencil-sharpener, made with two hinged jaws, B B', and a sheath, C, substantially as and for the purpose set forth.

Second, The groove, b, and tongues, a a', in combination with the sheath and jaws, applied and operating substantially as and for the purpose described.

This invention consists of a pencil-sharpener, composed of two converging jaws, which are hinged to each other and to a sheath, and provided with projecting tongues, which drop into a groove of the sheath in such a manner that when the two are turned up together they are held closed by the grooves in the sheath, and in this case they are precisely like a pencil-sharpener of the ordinary construction, but if they are turned out each jaw can be readily cleaned and sharpened, or the jaw be removed and replaced by another whenever it should be desirable, without throwing away the whole instrument.]

49,211.—Inkstand. John Axtman, East Cambridge, Mass.:

I claim the combination of the stationary or interior perforated cap, b, or its equivalent, the perforated gate, d, and the rotary or superior perforated cap, a, arranged and applied together, substantially in manner and so as to operate as specified.

I also claim the construction of the rotary cap, concavo-convex, in manner and to act as a spring, as described, with respect to the gate.

I also claim the construction of the two caps, a b, when having the gate arranged between them, with the concavo-convex head, n, arranged in the manner and for the purposes specified.

49,212.—Submerged Force Pump.—A. Balding, Flora, Ill.:

I claim the combination of the upper and lower chambers, provided respectively with the ball valve and openings, and the hollow piston rod and chambered piston, the latter also provided with ball valves and openings, the whole arranged and constructed as described and represented.

[This invention relates to that class of pumps known as double-action. It has a hollow piston-rod, and a valve-chamber within the piston. The piston rod passes through the center of the upper valve-chamber.]

49,213.—Book Cover.—George F. Barden, South Adams, Mass.:

I claim a book cover, made substantially as herein described.

[The object of this invention is the production of an outside casting or covering, for the covers and backs of books, so made and folded as to be readily and easily inserted or placed thereon when desired, which coverings are made of different sizes, to conform to the varying dimensions of books.]

49,214.—File-cutting Machine.—James K. Barker, Lawrence, Mass.:

First, I claim the springs, R, and the rods, U, to bear upon the springs, R, for the purpose herein set forth.

Second, I claim the frame, Fig. 7, which is attached to the bed, A, of the machine, and independent of the carriage, B, in combination with the chisel-holders, O, rollers, Q, the springs, R, and the means of operating the springs and chisel-holder.

Third, I claim the springs, H, and the cam wheels, arranged as described, to regulate the force of the springs, H, for the purpose herein set forth.

Fourth, I claim the described improved machine for cutting a series of files at the same time, in the same machine, by a corresponding series of hammers and chisels, consisting essentially of the combination of the elements above claimed, and operating substantially as herein set forth and described.

49,215.—Process for Rendering Barrels Impervious to Petroleum, Etc.—Julius Baur, Brooklyn, N. Y. Antedated July 24, 1865:

I claim the within-described process of producing an oil-tight lining for barrels, etc., by first treating the wood with alum or its equivalent, and afterward with soluble glass, substantially as and for the purpose set forth.

49,216.—Snow Plow.—Abner L. Bausman, Minneapolis, Minn.:

I claim, First, A snow plow for railroads, constructed with double walls to admit of a steam or hot-air chamber between its exterior surfaces, to the purpose of keeping said surfaces in a heated state to prevent the snow adhering thereto, substantially as set forth.

Second, The employment or use of rotary shovels and brushes placed at the rear of the plow and over the two lines of rails, and arranged to operate in the manner substantially as and for the purpose set forth.

Third, The combination of the double-walled plow and rotary shovels and brushes, all arranged to operate substantially as and for the purpose specified

49,217.—Water Elevator.—Jacob H. Best, Schenectady, N. Y.:

I claim the application to the usual barrel and axle used for hoisting and lowering the bucket of a well or any weight, of a wheel, E, operating as a ratchet and friction or brake wheel, in combination with the winch, W, its brake piece, b, and its pawl, R, also the pawl, P; the whole arranged substantially as described and for the purposes set forth in the within specification.

49,218.—Preparing Peat for Fuel.—Albert Betteley, Boston, Mass.:

I claim the employment of a tank in the preparation of peat for fuel, substantially as described.

49,219.—Nailed Boot or Shoe.—Lyman R. Blake, Boston, Mass.:

I claim a shoe in which the vamp and sole are united by nails having an inclination with respect to each other, substantially as set forth.

49,220.—Artificial Cork.—Louis Bock and Albert F. Wheeler, Sheboygan, Wis.:

We claim a compound of caoutchouc or india rubber and waddy dust or fiber, in the proportions hereinbefore set forth, or in any other proportions producing the same results, substantially in the manner and for the purposes herein set forth.

49,221.—Hygrometer.—Reinhold Bocklen and Wm. Staehlen, Brooklyn, N. Y.:

We claim, First, The employment of the spring, A, made of ratan or any other kind of wood, and artificially coiled and prepared, operating in the manner and for the purpose herein shown and described.

Second, The combination of the spring, A, made of ratan, with the hand, B, or its equivalent, for indicating moistness contained in the air surrounding it.

Third, The peculiar treatment and construction of the spring, A, in hardening, preparing and preserving the same, for the purpose and in the manner herein shown and described.

49,222.—Attaching Horn Handles to Knives, Etc.—Miles Bradley, Westport, Conn.:

I claim by means of a die, molding or compressing the horn into the desired form while on the tang and countersinking the heads of the rivets and washers at one and the same operation, substantially as set forth

49,223.—Lock.—E. W. Brottell, Newark, N. J.:

First, I claim the vibrating knife, I, partaking of the motion of the bolt, B, but compelled to turn around a center, i, substantially in the manner and for the purpose herein set forth.

Second, I claim inclosing the tumblers, M, within two separately constructed casings, E and G, arranged to operate substantially as and for the purpose herein set forth.

Third, I claim the arrangement of the open tumbler, M, in the turning part, E, and adapted to operate relatively to the swivelling or vibrating knife, I* I**, substantially in the manner and for the purposes herein set forth.

49,224.—Blacking Box.—J. S. Brooks, Rochester, N. Y.:

I claim the combination of the form of the box with the holder, B, the same forming a new article of manufacture, when constructed as shown, and for the purposes specified.

49,225.—Bread and Meat Cutter.—Wm. Budd and J. L. Husband, Philadelphia, Pa.:

We claim the combination and application of the rod, C, frame, D, and knife, A, figure 2, as hereinbefore substantially set forth, and for the purpose described.

49,226.—Feathering Paddle Wheel.—James Burson, Yates City, Ill.:

I claim, First, A plurality of cam guides for feathering the buckets, as herein specified.

Second, In combination with the aforesaid cam guides, I further claim the guide rods, D D, attached to opposite sides of the buckets in the manner described.

49,227.—Construction of Railway Train and Car.—Samuel R. Calthorp, Roxbury, Mass.:

I claim giving to the exterior surface of a railway train a form tapering from the center of the train toward either end, or tapering the engine or car at the front or rear of the train, substantially as described, for the purpose of diminishing the atmospheric resistance.

I also claim constructing the engine and its truck with a projection in front, in its several parts, of the shape substantially as set forth, and encasing its body both above and below, substantially as set forth, and rounding its cab, so that its projection and main casing, while protecting its own surface from the direct resistance of the wind, may, together with its rounded cab, form a single prow to the whole of the train, in the manner and for the purpose herein described.

I also claim placing a false bottom, substantially as described, under each carriage of the train for the purpose of protecting the trucks and other projecting surfaces under the carriages from the adverse action of the wind.

I also claim inclosing the whole space between any two contiguous carriages of the train flush with the sides, top and bottom aforesaid, which is extended under the platform, in combination with the projecting roof already in use, and a flexible hood or hoods, substantially as set forth.

49,228.—Shingle Machine.—George Challoner Omro, Wis.:

First, I claim the means employed for operating or tilting the bed, I, to wit, the sliding bar, L, provided with inclined projections, q q, the lever, M, attached to L, and the lever, N, attached to wheel, C, all arranged substantially as set forth.

Second, The projection, t, at the inner side of the rim, b, of the wheel, C, in connection with the cranks, h h, springs, f, and rollers, k, all arranged substantially as shown for operating the jaws, F.

Third, The sliding bar, K, provided with arms, p p, pivoted to pendants, o o, of the plate, n, which supports the bed, I, for the purpose of raising and lowering said bed, as set forth.

Fourth, The platform, O, in combination with the tilting bed, I, and the devices for releasing the jaw or dog from the bolt, substantially as described.

[This invention relates to a new and improved machine for sawing shingles, and of that class in which a series of bolts are placed upon a horizontal rotating wheel, and acted upon by a horizontal circular saw placed underneath the wheel.]

49,229.—Washing Machine.—John Champlin, East Middlebury, Vt.:

First, I claim the beaters or battle boards, C C, arranged in the box of a washing machine, so as to operate substantially in the manner specified.

Second, The combination of the trough, A, box, B, and battle battle boards, C C, substantially as shown and described.

[This invention consists in the employment or use, in a suitable revolving box, barrel, or other receptacle for clothes while being washed, of two or more beaters or battle boards, so arranged that they will act upon the clothes as the box is revolved, and thus the more effectually and quickly cleanse or extract the dirt from the same.]

49,230.—Apparatus for Filtering Petroleum.—Robert A. Chesebrough, New York City:

I claim the application of heat to a filter for hydro carbon or other oils by means of a triple cylinder or steam worm coiled inside or outside of the filter, as herein set forth.

49,231.—Mode of Constructing the Heads, Necks and Connections of Gas Retorts.—John Chilcott, Brooklyn, N. Y. Antedated July 24, 1865:

I claim making the neck and head and the connection for the main of a gas or other retort, or either of them with double walls having a space between the inner and outer walls filled with plaster of Paris, or other poor conducting material, substantially as and for the purpose herein specified.

49,232.—Amalgamator.—Thomas J. Chubb, Brooklyn, N. Y.:

First, I claim subjecting the ores of precious metals in a disintegrated state to the action of revolving or oscillating plates, which are coated with mercury, when such plates are arranged within chambers that are formed in such manner that the ore is subjected to both sides of the plates and caused to flow over a bath of mercury in a continuous stream, substantially as described.

Second, The arrangement of the fixed partitions, D, on each side of the movable disks, C, in such manner as to form a continuous passage through the cylinder, A, for the flow of the ore, substantially as described.

Third, The use of steam, in combination with a series of disks, C, moving in a bath of mercury, for the purpose of bringing the atoms in closer contact with the surfaces of said disks, substantially as described.

Fourth. Subjecting the ores of precious metals in a disintegrated state to the action of revolving or oscillating plates which are covered with mercury, when such plates are arranged in such manner that the ore is subjected to both sides thereof, and caused to flow past or over the same and over a mercury bath, the plates dipping into said bath for the purpose of removing the precious metals collected thereon and depositing them in the bath, the plates themselves becoming cleaned and freshly coated with mercury of the bath thereby, substantially as described.

49,233.—Steering Apparatus.—George Coffin, Boston, Mass.:

I claim the arrangement of the two sets of toggle-jointed levers attached to the rudder post, and operated by the steering wheel substantially as hereinbefore described.

49,234.—Artificial Limb.—Jesse Coombs, Greenfield, Mass.:

I claim making artificial limbs of strips of metal or other material, woven spirally and riveted, or arranged spirally and riveted, substantially as described.

I also claim the spring, W, secured at the ankle joint, with one arm working in the leg and the other in the foot, substantially as described.

I also claim an air or water cushion, for the sole or under the sole of the foot, inside of the boot or shoe, to enable the wearer to walk without, or with far less, jar to his system when he steps than he could do without the cushion.

I also claim making two or more cylindric air or water cushions, or cushions of other materials, with a vacuum or suction space between them around the stump of the natural limb, substantially as described, to hold the artificial limb on to the natural limb.

49,235.—Ditching Machine.—A. W. Cox, Dublin, Ind.:

I claim, First, The combination of trough, M, shovel, T, elevator, R S, pulleys, L L, constituting the apparatus for digging and carrying back the excavated matters.

Second, The described digging and elevating apparatus, hinged to the rear upper part of the frame, and having its forward or digging end both suspended and vertically adjusted by the racked coulters, gearing to pinions, O O, under control of the attendant.

Third, The slotted bearings, n, in the racked coulters, for the purpose specified.

Fourth, The combination of the devices, F G H I, for suddenly changing the course of the shovel, in the manner set forth.

49,236.—Locomotive Boiler.—Samuel Crawford, New York City:

I claim the plan of making the bottoms of the water legs or hollow walls of the furnaces of steam boilers, of the character described, a removable but steam-tight frame, by the employment of the devices, substantially as described, and for the reasons and purposes explained.

49,237.—Pruning Metallic Cartridges.—Silas Crispin, New York City:

I claim the cartridge, constructed as described; that is to say, with the fulminate placed within a projecting annular recess or rim, which is formed at a point between the ends of the cartridge case, substantially as described.

49,238.—Process of Preserving the Roots of Hop Vines by Charring the Stems.—Schuyler Cummings, Middlefield, N. Y.:

I claim the process and mode of treating hop vines, substantially as above described, for the purpose of preventing them from bleeding after being cut in harvesting the crop.

[The object of this invention is to close the pores of that part of the vine which is connected with the root, and thereby prevent it from bleeding, and so preserve the root from exhaustion and premature decay when the vine is cut down in the work of harvesting a crop of hops.]

49,239.—Ditching Machine.—Wm. H. Dalbey, Clarksbury, Ind.:

I claim the team, A, having the mounted yoke, B, applied to it, as shown, in connection with the cutters, G H I, box, K, and inclined elevator, L, all arranged to operate in the manner substantially as and for the purpose herein set forth.

I further claim the toothed drum, M, armed with teeth, e, and connected to the roller, c', of the elevator, L, by gearing, f, for the purpose of driving the elevator, as set forth.

[This invention relates to a new and improved machine for cutting drains and ditches, and it consists in the employment or use of cutters, and an elevator, arranged with a beam mounted on wheels, whereby the work may be done very expeditiously and in a perfect manner.]

49,240.—Apparatus for Dressing Silk Thread, Etc.—John Day, Brooklyn, N. Y.:

I claim the combination of a gumming apparatus, with a drying and finishing box, constructed and arranged substantially as and for the purposes set forth.

I also claim, in combination with the above, the hot-air blast for drying the threads, as specified.

49,241.—Steam Boiler Furnace.—T. B. Dexter, Lynn, Mass.:

I claim the arrangement of the devices for driving the blower, g, consisting of the steam pipe, e, wheel, e, and shaft, f, operating substantially as set forth.

Also, The combination of devices, by which the blast can be changed from a hot to a cold, substantially as set forth.

49,242.—Manufacture of Capsules.—Dundas Dick, New York City:

I claim, in combination with the central cone or plug, a, the detachable encasing or surrounding side mold pieces, arranged together, substantially as and for the purpose described.

[This invention relates to the molds in which capsules are molded, and consists in a novel construction and arrangement of them, whereby the capsules can be molded with great rapidity and nicety.]

49,243.—Car Brake.—S. R. Dimmock, Syracuse, N. Y.:

I claim the arrangement of the pinions, L and H, inside of the oscillating frame, E, the stop, n, on the side of the pinion, I, the drum, r, inclosing the spring, k, the two forms of spring latch, M and m', with their attachment, as above described, the double crank in its several parts, and with its attachments, as above described, and the plate, I, all constructed and operating as and for the purpose herein shown and described.

49,244.—Lamp Stand and Clothes Dryer Combined.—John Donaldson, Rockford, Ill.:

I claim, First, The combination of a lamp stand with a drying frame, arranged and operating substantially as described, for the purpose set forth.

Second, The combination of the slotted stem, carrying the drying arms with the screws on the pedestal or stem, substantially as described, for the purpose set forth.

49,245.—Steak Mangler.—J. P. Dorman, Galesburg, Ill.:

I claim the construction of the cast-iron longitudinal triangular-shaped tooth-plate, and the application of it, substantially in the manner and for the purpose herein set forth.

49,246.—Table Knife.—J. Olden Ely, Philadelphia, Pa.:

I claim, First, The metal bolster, H, cast to and arranged to embrace the handle and blade of a knife, substantially as and for the purpose herein set forth.

Second, The projection, i, of a dovetailed or equivalent form on the end of the handle, when arranged for the retention of the bolster, X, as set forth.

Third, The bolster, X, the dovetailed projection, and shoulders, y y, of the handle, and the notches, c, of the blade, the whole being arranged as and for the purpose herein set forth.

49,247.—Manufacture of Pyroligneous Acid.—A. H. Emery, New York City:

I claim the use of steam or superheated steam in the distillation of wood in the manufacture of pyroligneous acid, etc., in those cases in which the amount of steam used is greatly decreased or discontinued during the whole of or a large portion of the time in which the wood is being charred.

49,248.—Manufacture of Pitch.—A. H. Emery, New York City:

I claim the art of making pitch from pine wood by one distillation

49,249.—Manufacture of Turpentine, Etc.—A. H. Emery New York City:

I claim distilling wood under more than atmospheric pressure without the application of steam or superheated steam.

49,250.—Corn Planter.—J. W. Fawkes, Decatur, Ill.:

I claim the pivoted bars, D D, and springs, E E, or their equivalents, in connection with the reciprocating slide, B, provided with the cells, a a, substantially as and for the purpose set forth.

[This invention relates to a new and useful improvement in the corn-dropping device, and has for its object the dropping of the corn without breaking it, and the consequent even distribution of the same

49,251.—Wire Heddles for Loom Harness.—Milton Finkle, New York City:

First, Making weavers' weddles of a single strand of wire, substantially as and for the purpose above described.

Second, I also claim forming the eyes of wire heddles with smooth surfaces by bending the strand, substantially as above described.

Third, I also claim soldering the eyes of wire heddles, for the purpose of keeping them compact and firm, substantially as above described.

49,252.—Clamp for Straps.—John J. G. Fisher, Foxboro, Mass.:

I claim the holding plate, D, operated by the screw, b, or equivalent mechanical device, in combination with the box or frame, B, operating substantially as set forth.

49,253.—Artificial Leg.—James A. Foster, West Stockholm, N. Y.:

I claim the lever, P, of the toe-piece, I, in combination with the stop, q, of the foot, and the spring cord, k, substantially as and for the purpose herein specified.

In combination with the cord, k, I also claim the adjusting arm, M, and lever, H, so arranged and operating that the tension of said cord may be modified by merely moving the arm outward or downward, substantially as herein set forth.

I also claim the combination and arrangement of the lever, H, spring, m, and nut, n, with the bolt, G, and boxes, i i, in such a manner as to tighten the knee joint and to obviate its rigidity, as herein specified.

I also claim the arrangement of the ankle joint, consisting of the iron, D, provided with the central bearing, f, the bolts, b b, and the turning eye, E, constructed as described, the whole being used in combination with the foot, C, and ankle, B, substantially as specified

I also claim holding the cord, k, in place, to prevent friction and wear in its action, by means of the loop, w, arranged and operating as herein set forth.

I also claim the inclined stop, s, in the heel of the foot, in combination with the bearing, e, of the ankle, substantially as herein set forth.

49,254.—Electric Gas Lighters.—Edward J. Frost and George A. Lawrence, Springfield, Mass. Antedated July 24, 1865:

We claim the combination of an electric magnet with a valve, D, or its equivalent, when applied to the pipe of a gas burner and operated by means of the axial bar, G, as set forth.

Second, The valve, D, as described, when used in combination with the axial bar, G, or its equivalent, substantially as described.

49,255.—Machine for Removing Scale from Steam Boiler Flues.—P. Eldredge Garvin, Philadelphia, Pa. Antedated March 30, 1865:

I claim the arrangement of the screw, D, the cutter, E, the base plate, F, with the conical-shaped collar, c, and the groove, d, the dog, H, and the thumb screw, K, constructed and operated for the purpose and in the manner as herein described.

49,256.—Fruit Jar.—William T. Gillinder and Edwin Bennett, Philadelphia, Pa.:

We claim the formation of the groove in the cover, with shoulders supporting the elastic pad, and with a central depression into which the pad is forced by the upper edge of the jar on the downward pressure on the cover by the screw cap, substantially as described.

49,257.—Gas Fitter's Hook Blank.—Elliott P. Gleason, New York City:

I claim the hook blank, or its equivalent, having a contour, substantially as described, as a new article of manufacture.

49,258.—Composition for Exterminating Grasshoppers.—Samuel Green, Denver, Colorado Territory:

I claim the combination and mixture and preparation of the above enumerated ingredients, in the aforesaid manner, for the purposes above set forth, and the exclusive right to prepare the same for use and sale in those sections of the United States where grasshoppers are so numerous as to completely destroy growing crops.

49,259.—Grease Cup.—Gebhard Hagenmeyer, Big River, Cal.:

I claim the arrangement of the valves, B B', the stems, C C, the seats, c c', bulb, A, cup, D, and vent-hole valve, i, in the manner and for the purpose substantially as herein shown and described.

49,260.—Cane Stripper.—Joel A. Hall, Memphis, Tenn.:

First, I claim stripping the blades from cane by means of two pair of curved yielding knives, arranged in such manner that the second pair of knives will complete the work left unfinished by the first pair, substantially as described.

Second, Providing the knife blades or strippers with auxiliary cutters, i i, substantially as described.

Third, The combination of guide rollers with cane strippers, substantially as described.

49,261.—Buckle.—William Smith Hall, Quincy, Mass.:

I claim the improved clamp buckle as made with a tongue having hooks so applied that the strain of the strap upon them clamps the edge of the tongue down upon the strap, substantially as set forth.

49,262.—Sewing Machine.—Thomas J. Halligan, New York City. Antedated Feb. 8, 1865:

I claim, First, waxing the thread on its way to the needle by passing the thread through a wax cup, which is provided with an elastic bottom, t, and also with means for keeping the wax in the cup in a fluid state, substantially as described.

Second, The elastic bottom, t, and the guide tube, t1, which is attached to the wall of the wax cup, 11', applied together in the construction of a sewin machine, substantially as described

Third, The combination of the take-up, B', needle bar, A2, waxing contrivance, 11', and shaft, B, substantially in the manner described for the purpose of re-waxing the thread, as set forth

Fourth, The manner shown of arranging the vibrating take-up arm, B', in connection with the shaft, B, and operating this arm by means of this shaft, B, which is arranged at right angles to the line of feed and which also operates the needle bar, substantially as described.

Fifth, Holding the work down upon the table during the upward movement of the needle bar by means of a pressure foot, c', which rises at the proper time to allow the work to be fed under the needle, and which is located to one side of the needle and of the pressure pad, and is operated by the devices as described.

Sixth, The hinged screw rod, r2, and adjusting nut, S, applied to the open, forked end of the pressure lever, r', substantially as described.

Seventh, So applying the awl, m, to the needle bar, A2, that this awl can be adjusted and set nearer to or farther from the needle, m, according to the length of stitch required, substantially as described.

Eighth, The use of the vibrating and longitudinally adjustable lever, D, in combination with the shaft, C, and pawl, e', for giving motion to the feed wheel, E, substantially as described.

Ninth, The combination of levers, D' E' and D, for adjusting the pawl, e', substantially as described.

Tenth, The use of two or more ratchet wheels having teeth of different lengths in conbination with a feed wheel, E, and adjustable spring clamp, G, substantially as described.

Eleventh, In the construction of a skeleton or open shuttle carrying frame, the combination of the stirrups, h h, bars i i, rear abutment, j, and spring, k, these parts being formed and arranged in the manner and for the purpose described.

Twelfth, The use of two or more transverse bars, t2 t2, within a space, t, of a shuttle, for the purpose of creating tension upon the ower thread of a sewing machine, combined with the depression, t', for allowing the thread to traverse laterally back and forth the full length of the bobbin, and preventing the thread from over-riding, as herein described and set forth.

Thirteenth, A device for smoothing the wax thread on its way to the needle, consisting of a metallic clamp, p p', constructed and operating as described and encircling a rubber block, p2, through which the thread passes.

Fourth, A needle for using wax thread which is formed with a groove, 2, extending above and below the eye, on one side, and a groove, 3, extending only above the eye on the opposite side, and with its eye inclined as far as practicable in a direction approaching the axis of the needle, and otherwise constructed substantially as and for the purpose set forth.

Fifteenth, Heating that part of the face of the shuttle race plate which is in close proximity to the place where the leather is being severed by means of a lamp or burner applied, substantially as and for the purposes set forth.

49,263.—Steam Generator.—Joseph Harrison, Jr., Philadelphia, Pa.:

I claim the manufacture of the slabs of my steam generator in sections cast or formed of one or more pieces, committing wholly or in part the tie rods or bolts and the joints described in specification of patent granted to me from the United States Patent Office, Oct. 4th, 1859

I also claim the manner of making the cross connections at one or more corners, or other points of the slabs for water and steam by the use of intermediate castings, having spherical or curved surfaces at the joints, in the mode and for the object set forth, or in any other manner, substantially the same, for accomplishing the like purpose.

I further claim the manner of combining the thin web with the spheres, as described, for the purpose of making a tight wall or casing for boilers, in the setting of which it is desired wholly or in part to dispense with brick work.

49,264.—Mode of Making and Venting Cores for Casting.—Joseph Harrison, Jr., Philadelphia, Pa.:

I claim the mode of making, using and venting cores or molds for castings as above described, for the purpose of strengthening them when made of weak, moist sand or similar material, and for the better venting the same by availing of a vacuum as above described, when the molten metal is poured into the mold.

49,265.—Corn Planter.—A. A. Hazard, New York City:

I claim the oscillating and distributing roller, b, in combination with the furrow opener, B, track clearing wings, a, spring, g, lever, e, trigger, f, handles, D D, and adjustable covering roller, E, all constructed and operating in the manner and for the purpose herein shown and described.

[This invention relates to an improvement in that class of corn planters in which the seed is distributed by the action of a roller with one or more seed-cells, to which an oscillating motion is imparted either by a trigger attached to one of the handles of the plow or by the action of a pin or cam projecting from the covering roller, said seed-distributing roller being subjected to the action of a spring which carries it back to its original position after each discharge of seed.]

49,266.—Forging Cannon.—Alonzo Hitchcock, New York City. Antedated July 30, 1865:

I claim making a cannon or other large forging by welding it in the furnace by the apparatus and in the method substantially as described.

49,267.—Slide Valve for Steam Engines.—Samuel F. Hodge, Detroit, Mich.:

I claim the combination and arrangement of the follower, C, packing, b, stuffing box, B, adjustable gland, E, and valve, D, substantially as described.

49,268.—Tobacco Pipe.—Christian Hoffman, Philadelphia, Pa.:

I claim the combination and arrangement of the bowl, A, the drip pipe, C, the drip chamber, B, the tube, D, the drip chamber, E, and the neck, G, substantially as herein shown and described.

49,269.—Horse Rake.—Franklin Holden, Clyde, Ill.:

First, I claim the suspending of the rake head, G, to the frame, A, of the machine, by means of swinging rods, D D, connected by chains, H, to the axle, A, substantially as and for the purpose set forth.

Second, The pawl, O, connected with the rod, P, in connection with the bar, N, in the rake head and handle, K, all arranged substantially as and for the purpose specified.

Third, The combination of the handle, K, pawls, M O, bar, N, and suspended rake, all arranged with a mounted frame, to operate substantially as and for the purpose set forth.

[This invention relates to a new and improved horse rake, of that class which are provided with a revolving straight-toothed rake, and it consists in a novel construction and arrangement of parts, whereby the device may be manipulated with the greatest facility, and the rake adjusted to operate at a greater or less distance above the ground, as the nature of the work to be performed may require.]

49,270.—Stair Rod.—H. M. Hoover, New York City:

I claim the rubber stair rod, constructed substantially as herein described, as a new article of manufacture.

[This invention consists in making stair rods for holding down carpets, wholly or partly of india-rubber or gutta-percha.]

49,271.—Tension Mechanism for Looms for Weaving Goods, with Elastic Strands.—Liveras Hull, Charlestown, Mass.

I claim the improved elastic strand tension apparatus, substansially as described, the same consisting of two or more wheels, A B C, and a friction band, e, and weight, f, or the equivalent thereof, arranged and applied together, and to the strand, substantially as specified.

49,272.—Facing Mold.—Joseph and Abraham Hursh, Philadelphia, Pa.

First, I claim the use of ochre, in its powdered state, for facing green sand molds, substantially as described.

Second, The use of ochre as a wash for facing cores and dry sand molds, substantially as above set forth.

49,273.—Apparatus for Separating Ochre from Sand.—Joseph and Abraham Hursh, Philadelphia, Pa.:

First, I claim separating ochre from the sand which contains it in its natural state, by means of a current of air, in such a manner that the sand falls while the ochre is borne forward into a separate place of deposit.

Second, The combination of the fan, C, with the chamber, G, and room, A, the whole being constructed and arranged in relation to each other, substantially as described and for the purpose specified.

Third, Burning the ochre, or subjecting it to a great heat, for the purpose of completing its adaptability for facing molds for castings, substantially as described.

49,274.—Lantern.—James Ives, Mount Carmel, Conn.:

First, I claim a chimney or cone base, fitted to the reflector base or globe frame of a lantern, so as to move with said frame, or maintain its position with relation thereto, when either the frame or the lamp is adjusted so as to expose the wick tube or top of the lamp, substantially as described.

Second, The devices herein described for connecting the chimney or cone base to the reflector or globe frame of a lantern, in such a manner that the base may at will be disconnected from the said frame, substantially as set forth.

49,275.—Last.—Pickmore Jackson, Saugus, Mass.:

First, The spring fastener, C, applied to the base and back of a last block, and operating in combination with the mortice, substantially as set forth and for the purpose described.

Second, The spring, G, and eye or staple, F, or their equivalents, in combination with the spring, C, substantially as and for the purpose described.

49,276.—Ditching Machine.—Samuel F. Jones, St. Paul, Ind.:

I claim the drag bars, d d', with adjustable colters, W W', and braces, o o', when arranged as shown and described, for the purpose set forth.

Second, I claim the self-adjusting scoop, I, apron, F, and weighted lever, m, when arranged substantially as shown and described, for the purpose set forth.

Third, I claim the method of hanging the upper ends of the sides of the trough, M, on the projected ends of the boxes, a'' a'', whereby a uniform length of the carrying band is obtained independent of the position of the lower end of the trough.

Fourth, In combination with the collars, W W', scoop, I, apron, F, projected boxes, a'', a''. I claim the spools, n m, chains, l l' and r r', carrying band, D, scraper, Z, and conveying spout, E, when arranged as shown and described for the purpose set forth.

49,277.—Boring Tool.—Miles Joy, West Greenfield, Pa.:

I claim, A, jar for a well-boring apparatus, composed of a pipe, A, having a slot, d, in it, extending nearly its whole length, a plug, B, secured in its lower end, and a thimble, C, on its upper end, containing a plug, D, having a square hole made in it for a rod, E, to work through which rod, E, is provided with a head, F, at its lower end said pipe, A, inclosing the rod, E, with its head, F, and protecting it from injury, substantially as herein described.

49,278.—Cooking Stove.—Wm. B. Kimball, Peterboro, N. H.:

First, I claim, in cooking and heating stoves the bottom plate, H, constructed and operating substantially as described, so that it may become at pleasure part of the bottom of an oven, or the fire back of a supplementary fire-place.

Second, I also claim sliding the partitions, N N, of the lower flue space, so as to contract or extend the flues, Q P Q, substantially as and for the purpose described.

Third, I also claim the means above described for operating the sliding partitions, to wit: the extension, c, of the bottom plate, and the projections, e d, of the partitions, substantially as shown.

Fourth, I also claim the front flue, C, and its damper, B, in combination with the space, F, below the fire-place, A, for the purpose of making a flue when that space is formed into a fire-place, substantially as described.

[The object of this invention is to produce a cooking stove which is capable of being changed into an open fire-place, or Franklin stove, or into a stove with a closed fire-place. This end is effected by converting the front part of the oven into an open fire-place, a portion of the oven-bottom becoming the back of the fire-place, and the flue division plates being the dogs of the fire-place.]

49,279.—Sewing Machine.—Wm. A. L. Kirk, Hamilton, Ohio:

I claim the arrangement herein described of the crank, B, pitman, C, cross-head, D, with a saw or saw-bar connected to the pitman at a point intermediate between the said crank and cross-head, for the purpose specified.

49,280.—Machine for Cleaning and Finishing Silk and other Thread.—Tobias Kohn, Hartford, Conn.:

I claim the combination of the reciprocating series of rollers, d, reciprocating guiding bar, p, and the rotary shaft, N, upon which the spools are mounted when the said parts are constructed and arranged to operate in the manner and for the objects specified.

49,281.—Rock Drill.—O. B. Latham, Seneca Falls, N. Y.:

I claim constructing the reamer with cutting angles, both above and below, making them reversible and adjustable in the body of the drill, substantially as specified.

49,282.—Lock.—Lewis Lillie, Troy, N. Y.:

First, I claim the employment of the grippers, i i, operated by means of the springs, h h, in combination with the combination wheel, F, and with the set wheel, L, the whole being constructed and arranged in the manner and for the purposes substantially as herein described and set forth.

Second, I claim the anti-micrometer or vertical latch, H, actuated by means of the spring, y, and by the triangular post or pin, t, in combination with the lifting slide, C, each being constructed and arranged in the manner substantially as and for the purposes herein-described and set forth.

Third, I claim the employment of the triangular post or pin, t, in combination with the sexangular slot, V, in the anti-micrometer latch, H, in the manner and for the purposes substantially as herein described and set forth,

Fourth, I claim the employment of the lock-bolt stops, R and N, in combination with the lifter slide, C, and with the lock bolt, B each being constructed and arranged in the manner and for the purposes substantially as herein described and set forth.

Fifth, I claim the employment of the bolt driver, S, firmly fastened to the inner end of the central shaft, G, in combination with the lock bolt, B, and with the lifting piece, E, securely fastened to the cross piece, E', of the lifting slide, C, in the manner and for the purposes substantially as herein described and set forth.

Sixth, I claim the combination of the conical barrel, D, with the central shaft, G, and with the combination wheels, F, in the manner and for the purposes substantially as set forth.

49,283.—Scaffold.—Horace Littlefield, Lewis, Iowa:

First, I claim the end supports, A B a b, in combination with the platform, D, and legs, C, constructed substantially as herein described.

Second, The legs, C, in combination with the end supports, A B a b, substantially as specified.

Third, The railing, E, stanchions, c c', in combination with the platform, D, and end supports or brackets, A b, substantially as herein specified.

[The object of this invention is to provide a portable scaffold, which may be quickly put together, readily adjusted for use to the side of a building or structure, and capable of having its height raised or lowered, as occasion may require, and it consists in constructing the end supports of the platform in the form of a triangle, one side of which rests against the building or structure, and in supporting the same on legs or props, which are forced into the ground.]

49,284.—Cut-off Valve Gear.—K. H. Loomis, Baltimore, Md.:

First, The plate, G, sliding in the lever, F, attached to the valve spindle, and jointed to and operated by the governor rod V, and sliding rod, H, or its equivalent, all substantially as and for the purpose specified.

Second, The rod, H, with its adjustable lugs, k k, connected to the plate, G, and operated by the vibrating lever, W, or its equivalent, substantially as and for the purpose set forth.

49,285.—Whiffletree.—T. R. Markillie, Winchester, Ill.:

First, I claim the levers, C and F, combined with each other, and with braces, D and E, constructed and operated substantially as and for the purposes specified.

Second, In combination with devices for working three horses abreast, the braces, G, constructed and operated as and for the purposes specified, substantially as described.

49,286.—Gate.—John M. May, Janesville, Wis.:

I claim friction rollers, J, or its equivalent, in combination with grooved rod, N, used in constructing a gate, and wheels, E and F, used in operating a gate, and for analogous purposes, when the whole are arranged and operated substantially as described.

49,287.—Tool for Fastening Tubes in Boilers.—Robert McConnel, Jacksonville, Ill.:

I claim a tool for fastening boiler tubes, composed of a mandrel, with a series of inclined grooves, in combination with a double set of dies, d e, and nut, h, to be used in connection with the expanding dies, e, substantially as and for the purpose set forth.

[This invention relates to a tool composed of a mandrel, provided with a series of inclined grooves, which form guides for a double set of dies—one set for expanding and the other for flanging—in combination with a follower nut, to be used particularly with the flanging dies, in such a manner that by the combined action of the mandrel and the expanding dies the expansion bead at the inner edge of the tube sheet is formed, and, at the same time, the outer end of the tube is spread over the outer edge of the tube sheet, thus keeping the tube firmly in its place, and by the subsequent action of the flanging dies, the outside flange of the tube is pressed up firmly against the tube sheet, and a tight joint is effected, with little loss of time and without the use of a hammer, the mandrel being fed up and turned by the action of the ordinary ratchet brace.]

49,288.—Washing Roller.—H. L. Moservey, Boston, Mass.:

I claim a hand-washing roller, consisting of one or more revolving frames, B, carrying a series of rolls, C, in combination with a handle, operating substantially as described.

49,289.—Vehicle.—O. E. Miles, Aurora, Ill. Antedated Aug. 7, 1865:

I claim the spring, D, in combination with the truss, A, short axles, b, and wheels, B, fixed on the latter, all arranged relative to each other, and to the other parts, E, etc., of the vehicle, substantially in the manner and for the purpose herein set forth.

49,290.—Lantern.—J. H. Multimore, Milwaukee, Wis.:

First, I claim the disk or ring, D, provided with the lugs, e, in combination with the projections, o, of the base, B, arranged and operating as and for the purpose set forth.

Second, I claim the band, E, provided with the inclines, l, in combination with the rod, n, as and for the purpose set forth.

Third, I claim securing the lamp by means of the bar or strip, f, and arms, g, when arranged to operate as described.

49,291.—Scrubbing Knuckle Shield.—C. A. Moore, Westbrook, Conn.:

I claim the above-described article or shield as my invention, as and for the purpose specified.

49,292.—Car Coupling.—M. C. Morse, Boston, Mass.:
First, I claim the grooved and pivoted cheeks, J' J', in combination with the yielding clamps, J J, substantially as set forth and for the purpose described.
Second, The arm, G, projecting in front of the bunter, A, in combination with the lever, E, and shackling pin, D, substantially as and for the purpose described.
Third, The link or dog, F, in combination with the arm, G, and lever, E, for the purpose of holding up the latter, substantially as described.

49,293.—Oscillating Steam Engine.—David Nation and T. B. Hall, St. Louis, Mo.:
We claim the combination and arrangement of the segmental boxes. B C, oscillating pistons, E E D. piston rod, G, steam chests, d d', valves, e', pitman. n, and eccentric wrist pins, e o, as and for the purposes herein specified.

[This invention relates to certain improvements in that class of engines known as oscillating piston engines. The cylinder is composed of two segmental boxes, which are bolted together by means of flanges, and the inner spaces of which are separated one from the other by a central boss, which is firmly keyed to the oscillating piston rod, and from which extend the pistons, in combination with suitable steam supply and exhaust ports, in such a manner that by the action of the steam on said pistons an oscillating motion is imparted to the shaft, which, by suitable connections, are converted into a continuous rotary motion of the fly-wheel shaft.]

49,294.—Machine for Bending Metal Rods.—G. J. Nevell, Philadelphia, Pa.:
I claim the lever. D, with its slot c, the anvil, C, and pin, b, combined with the levers, E F I. and the cam, H, or their equivalents, so that a bar of metal may be bent to a shape corresponding with that of the end of the lever, substantially as specified.

49,295.—Packing for Tubes of Boilers or Condensers.—Jacob Newkirk, Factoryville, N. Y.:
I claim the combination of a conically-recessed holding, and a conical-shaped packing ring fitting therein, both rings being held and tightened up against the head and the tube by screw bolts for holding and packing tubes to the heads of steam boilers or condensers, substantially in the manner and for the purpose described.

49,296.—Door Bolt.—J. E. Parker, West Meriden, Conn.:
I claim the combination of the bolt, a, spring, f, and dog, g, substantially in the manner and for the purposes set forth.

49,297.—Lock.—Jacob Post, Newark, N. J.:
I claim the combination with the notched latch bolt, c, of a lock of the spring bar or plate, g, and arranged together with regard to each other, and operating substantially as herein described and for the purpose specified.

49,298.—Lock.—Jacob Post, Newark, N. J.:
I claim the combination in locks of the turning cylinder, h, with its series of tumblers, n n n, outer casting or tube, d, and bridges, S S, arranged together and operating substantially in the manner described.

[The above inventions relate to a novel mode of hanging the latch bolt, and also to a peculiar arrangement of tumblers in the turning cylinder of a lock. the object being to produce a simple, cheap and strong lock for ordinary uses.]

49,299.—Machine for Slicing Cork.—John Power, Boston, Mass.:
I claim the yielding adjustable plug, E, in combination with the gage, D, constructed and operating substantially as and for the purpose described.

49,300.—Torpedo Boat.—G. M. Ramsey, New York City:
First, I claim the inclination of the roof, A, of a torpedo boat, as and for the purposes specified.
Second, The hole, e, constructed and situated substantially as described.
Third, The ratch, n, in combination with the pawl, P, bar, m, and boom, O, substantially as and for the purpose described.
Fourth, The springs, s, in combination with the bar, m, substantially as described.
Fifth. The bars, r r, in combination with the bar, m, as and for the purpose specified.
Sixth, The tube, b, running longitudinally through the torpedo, substantially as and for the purpose specified.
Seventh, The division, c, separating the magazine of the torpedo from the lock, a, substantially as and for the purpose specified.
Eighth, The cock, d, in combination with the powder tube, e, substantially as and for the purpose specified.
Ninth, The rod, f, also in combination with tube, g, and gutta-percha, and tube, i, substantially as and for the purpose specified.
Tenth, The pin, h, in combination with the lock, d, and rod tube, g, substantially as and for the purpose specified.
Eleventh, The hand hole through which the cap is supplied to the cock, d, substantially as and for the purpose specified.

49,301.—Air Pump.—Franklin Ransom, Buffalo, N. Y.:
First, I claim combining the elevated chamber, C, having the valve, d, as shown, with the pump cylinder, B, by means of a hollow bed plate, A, through which a constantly open communication between the said chamber and cylinder is maintained, substantially as herein specified.
Second, The arrangement of the chamber, C, condensing chamber, D, and valves, d c, substantially as and for the purpose herein specified.

49,302.—Seeding Machine.—E. D. and O. B. Reynolds, North Bridgewater, Mass.:
We claim a seed sower having a reciprocating seed box, operating in the manner and for the purpose substantially as set forth.

49,303.—Corn Sheller.—J. W. Ricker and T. S. Lewis, Chelsea, Mass.:
We claim the loosely-hung conductor, with its projection, arranged substantially as set forth, for insuring the proper presentation of the ear without clogging or obstructing the operation of the driving wheels.
Also, Combining with the teeth of the disk wheel for feeding out the cob the stationary guard teeth, operating in the manner and for the purpose set forth.
Also, The corrugated spring for keeping the cob up to the disk, without bearing upon its whole length, substantially as described.
Also, The weighted lever or arm, g, in combination with the spout or conductor, c, and its projection, d.

49,304.—Cartridge Box.—Wm. Rossiter, Newark, N. J.:
I claim the broad flat loop, d, consisting of a single piece of leather or other material, attached by its corners to the back of the cartridge box, a, and employed to confine both the belt, f, and shoulder straps, g g, which are passed between the said flat loop and the back of the box, all as herein specified.

[This invention relates to a novel mode of securing the shoulder and belt straps to cartridge boxes, whereby the many disadvantages and defects of the old method are obviated.]

49,305.—Shirt Stud.—Robert B. Ruggles, Hartford, Conn.:
I claim the button, a, having an unequally-perforated and slitted stud. b, in combination with the button. a', having an unequal-sized shank. c, working together substantially as and for the purpose described.

49,306.—Method of Making Wrist Pins.—E. P. Russell, Manlius, N. S.:
I claim an anti-friction crank or wrist pin, substantially as described. when constructed with a chilled metal suface or journal. surrounding a core of softer metal which projects from one end of said journal, the two metals being united mechanically in the casting of the former around the latter, substantially as and for the purposes set forth.

49,307.—Pocketbook.—Louis Saarbach, Philadelphia, Pa.:
I claim the plate, B, attached to a pocketbook or portemonnaie so as to slide over the side of the same and secure the flap, b, substantially as described.

49,308.—Sliding Doors of Railway Cars.—Albert G. Safford, Boston, Mass.:
I claim the improved rail, as made with the notches, a b c, for reception of the wheels of the door, and to hold the door either open or closed.
I also claim the application of each of the wheels to the door in such a manner that while the door may be raised in its frame, and with respect to the rail, the wheels may rest in contact with the top surface of the rail.
I claim the combination and arrangement of the relieving friction spring or springs, k, with the door, and to operate therewith and with the door case, substantially in the manner described.

49,309.—Buckle.—Cyrus W. Saladee, Putnam, Ohio:
I claim, First, Fastening buckles to harness, etc., by means of rivets, a. and plate, A, the plate, A, being the back bar of the buckle flattened out, and provided with a metallic loop, B.
Second, The combination of the metallic loop, B, plate, A, and rivets, a, for the purpose of securing loops to harness, etc.

49,310.—Apparatus for Liquoring Sugar in Centrifugal Machines.—Frank Seiberlich, Charlestown, Mass.:
I claim the combination of the jet tubes, A, the gate, C, and the conduit, B, applied together substantially as and for the purpose specified.
I also claim the combination of the lifter, D, the jet tube, A, the gate. C, and the conduit. B, the whole being arranged and so as to operate together subs antially in the manner as described.

49,311.—Hedge Trimmer.—A. Selover, Brooklyn, Ohio:
I claim the adjustable clamps, A B, adjusting screws, H. in combination with the adjustable standards, C D, substantially as and for the purpose set forth.

49,312.—Tightening Pulleys by Friction.—Franklin Skinner, New Haven, Conn.:
I claim the combination of the adjustable collar and its appendages, Fig. 3, with the conical slide, Fig. 5, and pulleys, C C', when they are constructed substantially as herein described, and are fitted for use, either double or single, on a proper arbor or shaft, as herein set forth.

49,313.—Fence.—Samuel Stanbro, Northville, Mich.:
I claim the stakes, H H, driven in the earth, bent over the sill, E, and secured at the outer or upper ends to the lower part of the fence, substantially in the manner as and for the purpose herein set forth.

[This invention relates to a new and improved manner of attaching or securing the fence to the earth, whereby the fence is securely held in position and at the same time rendered capable of being readily taken up or removed, and also readily secured in the position designed for it.]

49,314.—Bee Separator.—Jesse H. Starr, Middlebush, N. Y.:
I claim the bee separator consisting of a box divided into two compartments, which are made to communicate with each other by means of taper pipes, the lower compartment being provided with holes or apertures to admit of the exit of the bees, and all arranged substantially as and for the purpose specified.

49,315.—Photographic Camera.—John Stock, New York City:
I claim the arrangement of the front of the camera box, B, so that the same turns upon a horizontal axis passing through the center of the aperture, and also upon a vertical axis passing through the same center the bellows yielding to the motion without affecting their operation.
I also claim the tubular flange or ring, S, to which the lens tube is affixed, in combination with the tubular ring, T, acting as a universal joint, in the manner and for the purpose substantially as set forth.

49,316.—Elastic Mousing for Hooks.—Edward E. Stone, U. S. N.:
I claim a mousing of india-rubber or analagous non-corrosive material to be applied to hooks, substantially as described.

[This invention relates to a new and improved snap hook, and it has for its object the obviating of the difficulty attending the corrosion of the spring hitherto attached to this class of hooks, a contingency which precludes their use for marine purposes.]

49,317.—Machine for Cutting Tobacco.—Wiley J. Stratton, St. Louis, Mo., and H. G. Tidemann, New York City:
We claim the combination and arrangement of parts substantially as described and consisting of the rotating cutting wheel, moving at right angles to the reed, the feeding arrangement consisting of the shaft. cam, pawl, ratchet, feed screw and follower, the latter depressed by a single screw shaft, C passing through the bridge nut, a, under the rotation of the wheel, D'.

49,318.—Blowing off Steam.—Peter Taltavull, Washington, D. C.:
First, I claim the steam pipe, C, leading from the boiler, the water-inducting pipe, A. and the water-discharging pipe, B, combined and arranged so as to receive and discharge a powerful current of water through the side, M, of the vessel, substantially in the manner and for the purpose herein set forth.
Second, I claim the combination of the concentrically arranged and adjustable pieces, E F G and H, operating in the manner substantially as described and for the purpose set forth.
Third, I claim the combination of the pipes, A B and C, with the adjustable pieces. E F G and H, adapted to control the discharge of fluid, substantially as and for the purpose herein set forth.

49,319.—Bark Mill.—M. Spencer Thomas, Painted Post, N. Y.:
I claim the stationary hopper, A, provided with a circular rim, b, having a rough surface below, and with arms c, having a rough surface below, and teeth, e, above, in combination with the revolving rough surface disk, E, and breaker, D, all constructed and operating as and for the purpose set forth.

[This invention consists in a stationary hopper provided with a rim and arms made rough at their lower surface, and with teeth projecting upwards from the upper surface of said arms, in combination with a revolving rough surface disk below and a toothed revolving breaker above, in such a manner that by the action of said revolving breaker and toothed stationary arms the bark thrown into the hopper is crushed. and by the combined action of the rough surface disk and the corresponding rough surface rim and arms of the stationary hopper the crushed bark is reduced to the desired fineness in a simple and effective way, the whole being so constructed that it is simple in its construction, not liable to get out of repair, and operated with comparatively little power.]

49,320.—Stave Machine.—John S. Thompson, Glen Falls, N. Y.:
I claim the combination of the endless chains, G G, guides, H H, circular saws, T. cutter heads, U, cutters, V W, plates, X, and yielding plates, Y, all constructed, arranged and operating as and for the purposes described.

[This invention relates to a new and improved machine for champering and crozing staves and also for sawing them of a uniform length, the several operations above-named being performed simultaneously or at the same time, and the work performed in a perfect manner by a very simple mechanism.]

49,321.—Milk Stand.—Addison R. Titus, Warren, Pa.:
I claim the construction and arrangement of the frame, A B C, revolving shaft, D, brackets, G, flanges, H, and cone, K, substantially as described, and for the purposes set forth,

49,322.—Desulphurizing and Disintegrating Ores.—George Vining, Boston, Mass.:
I claim the revolving cylinder, A, in combination with balls, G G' G", etc., or their evuivalents, tubes, E and D, cock, M, and seals, H H' H", etc., constructed in the manner and for the purpose above described.

49,323.—Clock Escapement.—M. Weaver and J. M. Sandifer, Somerset, Ky.:
We claim, First. The exterior figure, composed of the parts, A A d d, with the adjustable pallets, b b, secured by the set screws, c c, as set forth forming a part of the pendulum.
Second, The combination of the said parts with the escapement wheel, B, in the manner and for the purpose described.
Third, The adjustable pallets, b b, arranged and operating as described.
Fourth, The movable plate, C, operated by the set screw, f, for the purpose of setting and keeping the pendulum exactly on beat, as set forth.

49,324.—Horse Shoe.—A. Weitman, West Union, Iowa:
I claim the securing of the shoe to the hoof by means of one or more detachable or removable flanges, D, provided with lips, d, and constructed and applied in such a manner as to draw the shoe towards the hoof and cause it to fit snugly thereto under the action of the screw, e, and inclined surface of the parts, c and b, in combination with one or more fixed or permanent flanges, B, provided with lips, a, substantially as described.
I further claim the projections, 2 2, in connection with the detachable and permanent flanges, substantially as and for the purpose specified.

[This invention relates to a new and improved manner of attaching the shoe to the hoof of the animal, whereby the shoe will be firmly secured to the hoof, readily applied to and detached therefrom, and some elasticity allowed the shoe in order to render the latter comfortable to the animal, by relieving the hoof from jars and concussions.]

49,325.—Fire-place Heater.—H. H. Welch, Athens, Ohio:
I claim the fire-place heater, A, constructed as herein shown and described; that is to say, with the projections, D E, recesses, E, and pipes, B C, for the purpose explained.

[The object of this invention is to save a large amount of the heat that is now lost when fuel is burnt in fire-places, and it consists in the construction and application of a heater, to be placed in a fire-place, next to and partly ensconced within the fire back thereof, which heater is to be constantly supplied with fresh air, which air, after being heated, is discharged through suitable conveying pipes, and registered to any part of a house.]

49,326.—Explosive Shell for Ordnance.—Samuel Wells, New York City. Antedated June 28, 1865:
I claim the fuse hole, formed in the tapering portion of the shell, in combination with the projection, K, on the latter.

49,327.—Tool for Scaling Boiler Tubes.—John Werner, Jr., Prairie du Lac, Wis. Antedated July 26, 1865:
I claim the combination of the cutting tool, c c, screw, A, nut, B, guide plate, C, and plug, D, all arranged to operate substantially as and for the purpose herein set forth
I further claim the slotting of the plate, C, and the connecting of the nut, B, so that it may slide or be adjusted laterally, and having the plate, C, provided with a plug, D, substantially as and for the purpose specified.

[This invention relates to a new and useful implement or tool for cutting out and removing the incrustation in the tubes of tubular boilers; and it consists in the employment or use of an auger, arranged with a screw and nut, and also with a guide plate, whereby the desired work may be performed expeditiously and in a perfect manner.]

49,328.—Evaporating and Distilling Apparatus.—W. P. Wheeler, Louisville, Ky.:
I claim the vacuum pipe, C, or equivalent, with its lower end up turned, or otherwise sealed from the entrance of the atmosphere, applied in combination with the condenser, B, and evaporator or still, A, substantially as and for the purpose set forth.

49,329.—Method of Removing Incrustation from Gas Retorts.—A. J. White, New York City:
I claim the removing of the incrustation from the interior of gas retorts, by forcing a current of air through them by means of a pump, fan, or other equivalent device, substantially as shown and described

49,330.—Grain Shovel.—E. P. Williams, Buffalo, N. Y. Antedated Aug. 4, 1865:
I claim a grain shovel, having a skeleton runner frame, A, and pendent flaps or shovel blades, F, with an elastic compressible top or covering, E, for the purposes and substantially as described.]

49,331.—Manufacture of Iron.—J. D. Williams, Allegheny City, Pa. Antedated July 9, 1865:
I claim the use of the ingredients herein named, when used in the manufacture of iron, said ingredients being used substantially in the manner herein described and for the purpose set forth.

49,332.—Steam-warming Apparatus.—C. A. Wilson, Cincinnati, Ohio:
I claim the separate return pipe, E, provided with the closable discharge passage, F f, and with the automatic valve-guarded return passage, G g, which empties into the boiler, the whole being combined and operating substantially as set forth.

49,333.—Coal Stove.—Gurdon G. Wolfe, Troy, N. Y.:
I claim, First, The employment of the said self-feeding reservoir or chamber, E, surrounded by the air heating chamber, D, with cold air supply tube, C, arranged and combined with a base-burning coal stove, in the manner substantially as and for the purpose herein described and set forth.
Second, I also claim the employment of a fire pot or combustion chamber, constructed with an annular hot-air chamber, with openings. B B, arranged in the manner substantially as herein described and set forth
Third, I also claim the combination of the damper, H, with the openings or dampers, O O, in the coal supply reservoir or chamber, and said air-heating annular chamber D, in the manner substantially as and for the purpose herein described and set forth.

49,334.—Portable Steam Engine.—William Wright, New York City:
I claim the arrangement of portable steam engines, with reference to the manner herein described of attaching the engine proper to the boiler

49,335.—Sirup Stand for Soda Fountains.—C. M. Berry and Charles C. Sheldrake (assignors to themselves and J. Bready), Philadelphia, Pa.:
We claim constructing mineral water sirup stands of cast iron, and enameling the interior and exterior surfaces of the same, to protect them from the action of the acid contained in the sirups.

49,336.—Boring Tool.—Wessel Brodhead (assignor to C. L. Edmonds), Rondout, N. Y.:
I claim the boring tool herein described, consisting of a fine feeding screw, B, and arm, C, sliding in the head of the said feeding screw, and having permanently attached to it the shank, d, of a cutter, D, formed with a chisel point, e, a curved neck for the ejection of chips, and two fleam-shaped blades, f f, all the parts being constructed and arranged to operate as and for the purposes specified.

49,337.—Connecting Gages, Calipers and Rules.—Nelson H. Bundy (assignor to Nahum M. Dow), Boston, Mass.:
I claim the mode of connecting the several instruments, viz, the calipers, wire gage and foot rule, as hereinabove set forth.

49,338.—Fastening Keys in Locks.—Joseph H. Desalusse (assignor to Alfred B. Justice), Philadelphia, Pa.:
I claim the use of a revolving escutcheon, in combination with a pall, as set forth.

49,339.—Military Insignia Woven in Cloth.—A. M. Dorman (assignor to himself and Samuel Yewdall), Philadelphia, Pa.:
I claim military insignia woven in the cloth, and excised therefrom preparatory to attachment to the apparel, all substantially as herein shown and described.

49,340.—Oyster Dredge.—Edward Fairbanks (assignor to himself and Levi Bowen), Baltimore, Md.:
I claim the combination and arrangement of a reel with a revolving standard and crane arm, when so arranged as to compose a

winder for oyster dredges, substantially in the manner and for the purpose described.

49,341.—Spoke Machine.—Junius Foster (assignor to himself and John Slocum), Long Branch, N. J.:

I claim the arrangement of the cutter, G, attached to the reciprocating block C, the adjustable gage bar, H, and slotted plates, I I' J J', all constructed as and for the purposes herein specified.

49,342.—Device for Raising Sunken Vessels.—George W. Fuller, Chelsea, Mass., assignor to himself and Peter E. Falcon, Cohassett, Mass.:

I claim the mode substantially as above described of overcoming the adhesion of a submerged vessel to the mud or ground on which she may be deposited.

49,343.—Plumber's Hook Blank.—Benjamin F. Gladding, Providence, R. I., assignor to Elliott P. Gleason, New York City:

I claim a new article of manufacture of my invention, the plumber's hook blank, with a disposition of its material, substantially as described.

49,344.—Stove Grate.—James Glass (assignor to Cox, Church & Co.), Troy, N. Y.:

I claim the removable end pieces, D D, in combination with the grate, B, shaft, C, and bed plate, A, operating as, and for the purposes set forth.

49,345.—Churn.—Horace L. Hervey (assignor to himself and John Hart), Philadelphia, Pa.:

I claim the combination and arrangement of the two cylinders, A, and piston, D E, with the perforated plates, F, at the bottom of the cylinders, for the purpose of simultaneously forcing the cream up through one plate, F, by exhaustion, and down through the other plate, F, by pressure, substantially as described.

49,346.—Gas Engine.—Pierre Hugon (assignor to Emil Just), Paris, France.

I claim First, the method herein described of igniting in gas engines, the gaseous detonating compound, in the manner and for the purpose hereinbefore set forth, that is to say, by the employment, in combination with one or more side valves constructed for operation, substantially as shown and described, of one or more lighting and inflammatory or igniting burners, whereby the use of electricity as the medium to unite the said compound may be dispensed with.

Second, In gas engines, that is to say, in engines in which the motive power is a gaseous compound, to be ignited within the cylinder, or in any vessel communicating therewith, I claim the employment and combination with the said, a gaseous compound of water, or other vaporizing liquid, substantially in the manner and for the purposes hereinbefore set forth.

Third, I claim the arrangement substantially as herein described, of the side valves for the distribution of the detonating mixture and of the ignition thereof at given intervals of time, in combination with lighting and igniting burners, as set forth.

Fourth, I claim the arrangement and combination of parts for the injection of water around and into the cylinder, substantially as herein described and for the purpose set forth.

Fifth, I claim the general arrangement and combination of gas engine, substantially as hereinbefore described and shown in the annexed drawings.

49,347.—Paper Collar.—S. B. Hutchinson, Nashua, N. H., assignor to himself, G. W. Ray and V. N. Taylor, Springfield, Mass.:

I claim a paper collar, part of the surface of which is enamelled, as herein described.

49,348.—Car Coupling.—Sylvanus D. Locke (assignor to G. W. Campbell), Janesville, Wis.:

I claim, First, A car coupler, when constructed and arranged substantially as and for the purpose set forth.

Second, The combination and arrangement of the dog, g, and swing table, a, substantially as and for the purpose set forth.

Third, The combination and arrangement of the case, m, and spring, k, substantially as and for the purpose set forth.

49,349.—Welt Machine.—B. U. Lyon (assignor to himself, Grant Judd, E. P. Whitney and J. P. Reed), Stamford, Conn.:

I claim the combination of the guides, G G', with the two pressure rollers, B B', all arranged to operate in the manner and for the purpose herein described.

49,350.—Snap Hook.—Clark Marsh, Bridgeport, Conn., assignor to Hotchkiss Sons, New York City:

First, I claim in snap hooks the employment of the spring, E, in combination with a bearing, d, at some distance from the clip or root of the spring, adapted to brace the spring stiffly against the strain thereon in one direction, while allowing the elasticity of the entire spring to be made available in the proper yielding action, substantially as herein set forth.

I claim in snap hooks the passing the spring, E, through the body, so that a portion shall serve in the front and another portion serve at the back, and contribute its elasticity to operate the portion in the front, substantially as and for the purposes herein set forth.

49,351.—Ice Pitcher.—Frederick C. Meyer (assignor to Ernestine Meyer), Philadelphia, Pa.:

I claim the valve, C, adapted to the spout and operated by the weight, D, through the lever, F, or its equivalent, all substantially as and for the purpose herein set forth.

49,352.—Oil Cup.—Robert Poole (assignor to himself and German H. Hunt), Baltimore, Md.:

I claim an oil cup in which the lid or cover is united to the bowl by a hinge, section and screw ring, substantially in the manner and for the purpose herein described.

49,353.—Felted Fabric.—Enoch Waite (assignor to Elliott Felting Mills), Franklin City, Mass.:

I claim the compound fabric made of felt cloth and hair combined or arranged substantially in the manner as described.

49,354.—Horse Hoe Cultivator.—Albion Webb (assignor to himself and D. M. Dunham), Bangor, Me.:

I claim, First, The manner in which the plates, E E, are secured to the cross bars, B B, of the machine, to wit, the oblong grooves, a, in said bars, B B, with notches, e, at their under surfaces, the covered rods, F, and eye bolts, G, all arranged in the manner substantially as and for the purposes specified.

Second, The securing of the blades, H, to the plates, E, by means of a single bolt, a, in connection with the ribs, b, and grooves, c, substantially as shown and described.

[This invention relates to certain improvements in horse hoes or cultivators of that class which are provided with oblique hoes or shares. The object of the invention is to render the hoes or shares of the machine capable of being adjusted with greater facility than hitherto, and also to render it stiffer and firmer, and to perform or work in a better manner.]

49,355.—Cabinet Organ.—George Woods, Cambridge, Mass., assignor to Mason & Hamlin, Boston, Mass.:

I claim the application to or within the aperture of the safety valve of cabinet organs or other wind instruments, or other apertures for the passage of air, of a perforated or porous diaphragm, whether of fibrous or other material, substantially as and for the purpose above described.

49,356.—Crimping Wire Cloth.—William Zerns (assignor to himself, J. R. Deighm and Jasper Snell, Pottsville, Pa.:

I claim the crimping of wire cloth, by placing the same, after being woven, between toothed plates, and subjecting it to pressure, substantially as set forth.

[Wire cloth of the coarse kind requires to have the wires crimped or bent, in order to bring the same as near as possible to a plane surface, and retain the wires in position. Hitherto the wires have been crimped before the weaving process, but, by this improvement, they are crimped after they are woven, by means of toothed plates.]

49,357.—Apparatus for Burning Hydro-carbons.—Wm. Lim and Arthur Barff, Glasgow, North Britain:

We claim the general arrangement and construction of apparatus for the utilization of the gases produced by the vaporization of mineral hydro-carbon oils, for the generation of steam and the production of heat generally, as hereinbefore described, or any mere modification thereof.

REISSUES.

2,047.—Harvester.—Rufus Dytton, New York City. Patented March 19, 1861. Reissued Sept. 13, 1864:

I claim, First, In machines having a hinged or flexible finger bar, raising such finger bar by means of a lever supported or pivoted at one end on the shoe or heel of the finger bar, and turning freely toward the finger bar, but rigid with it when turned in an opposite direction, by causing such lever, when the heel of the finger bar is raised, to be brought in contact with the pole or the frame of the machine, or a projection therefrom, so as to press or force down such lever, and thereby raise the outer end of the finger bar, substantially as set forth.

Second, In two-wheeled machines having a hinged finger bar and having the driver's seat controlled by the pole, instead of by the frame of the machine, and not using or employing a castor wheel to support the drooping end of the frame and the inner end of the finger bar, raising the inner end of the finger bar by means of a lever and cord or chain, or its equivalent, acting upon the pole or some part connected therewith as a fulcrum, when the outer end of such finger bar is raised by means of a lever supported or pivoted at one end on the shoe or heel of the finger bar, and turning freely toward the finger bar, but rigid with it when turned in an opposite direction, and operated as first set forth in the first claim.

Third, In two-wheeled machines having a hinged finger bar and a loose pole, and having the driver's seat controlled by the pole instead of by the frame of the machine, so arranging, with reference to the frame of the machine, the finger bar and the mechanism for raising it and the shoe that when the finger bar and shoe are raised by such mechanism their weight will be so thrown upon the two driving wheels that the use of a center wheel to support the drooping end of the frame can be dispensed with, and the machine can also be moved and turned with greater ease and facility.

Fourth, In a machine having two independent driving or supporting wheels, and having the driver not controlled by the pole of the machine, hanging the cutting apparatus by one of its ends, so that not only the entire cutting apparatus, but either end thereof, independently of the other end, can freely rise above or fall below the plane or surface on which the driving wheels are moving, in combination with mechanism or devices for raising both the outer and inner ends of the finger bar, by which the driver, when in his seat, by operating a single lever moving in one direction in a plane substantially parallel with the sides of the driving wheels, can raise the entire cutting apparatus, and support it upon the driving wheels, for the purposes set forth.

Fifth, In two-wheeled machines having a hinged finger bar and a loose pole, and having its driver's seat controlled by the pole instead of the frame of the machine, so arranging the levers that raise the inner and outer ends of the finger bar, that as these levers are operated the outer end of the finger bar shall be raised higher than the inner end, for the purposes set forth.

Sixth, I do not claim forming a guard finger in a single piece, nor do I claim forming it in such a manner as to cover the sickle bar and have openings in its under side for the escape of grass, and other substances, as such a form of guard finger has been known; but I claim a guard finger made in a single piece, covering the sickle bar, and having openings in the bottom thereof for the escape of grass and other substances entering with the sickle, when such guard finger is provided with a bearing surface, as i, connecting the upper and lower portions of said guard finger and resting against the edge of the finger bar and braced and sustained against lateral strain, as herein set forth.

2,048.—Apparatus for Rendering Lard, Tallow, Etc.—C. E. Gray, New York City. Patented January 31, 1865:

I claim, First, Making a close water jacket, in combination with the tank and a part of it, and arranging said water jacket so made a part of said tank, in direct communication with the furnace so that the water jacket shall intervene between the fire and the tank, and act as a means of conducting and distributing the heat from the fire to and around the substance contained in the tank.

Second, Using the steam generated in a close tank from the constitutional water in the fat for the purpose of aiding and controlling the escape of the noxious gases and vapors, either to a superheater, for consumption in the furnace, or to a deodorizer, for the purpose of condensing them, in the manner substantially as described for the purpose specified

2,049.—Apparatus for Rendering Oils and Fats.—C. E. Gray, New York City. Patented Aug. 18, 1863:

I claim, First, In connection with the digester, the use of a second steam-tight vessel, for receiving melted fat or other fluid material that may have been cooked under steam pressure, and for cooling down and purifying the same until it is in a proper condition for exposure to the atmosphere, substantially as described.

Second, The placing of a glass tube in the draw-off pipe from the digester or similar apparatus for the treatment of material under steam pressure, for the purpose specified, substantially as before described.

Third, In combination with the digester or receiver, the use of the jointed delivery pipe, V, supported near the surface of the fluid fat by the floats, as by W W, for the purpose of drawing off the supernatant contents of the receiver or tank automatically.

2,050.—Roof for Railroad Car.—A. P. Winslow, Cleveland, Ohio. Patented Aug. 9, 1859:

I claim, First, The plates, D, caps, F, and grooved rafters, B, when arranged substantially as herein set forth, for the purpose described.

Second, I claim forming an air chamber, G, between the sheeting or roof, A, and plates, D, when arranged as herein described, for giving free circulation of air to cool the car, and, at the same time, allow the water, dust, etc., to pass off at the end of said plates.

DESIGNS.

2,159.—Bust of Abraham Lincoln.—George J. Haller, Buffalo, N. Y.

2,160.—Trade Mark.—George Hosmer (assignor to himself and J. R. Winch), Boston, Mass.

2,161.—Bust of Abraham Lincoln.—Thomas D. Jones, Cincinnati, Ohio.

2,162.—Spoon Handle.—Raudolph Wendt, New York City.

PATENTS

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[See Judge Holt's letter on another page.]

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Fig. 1

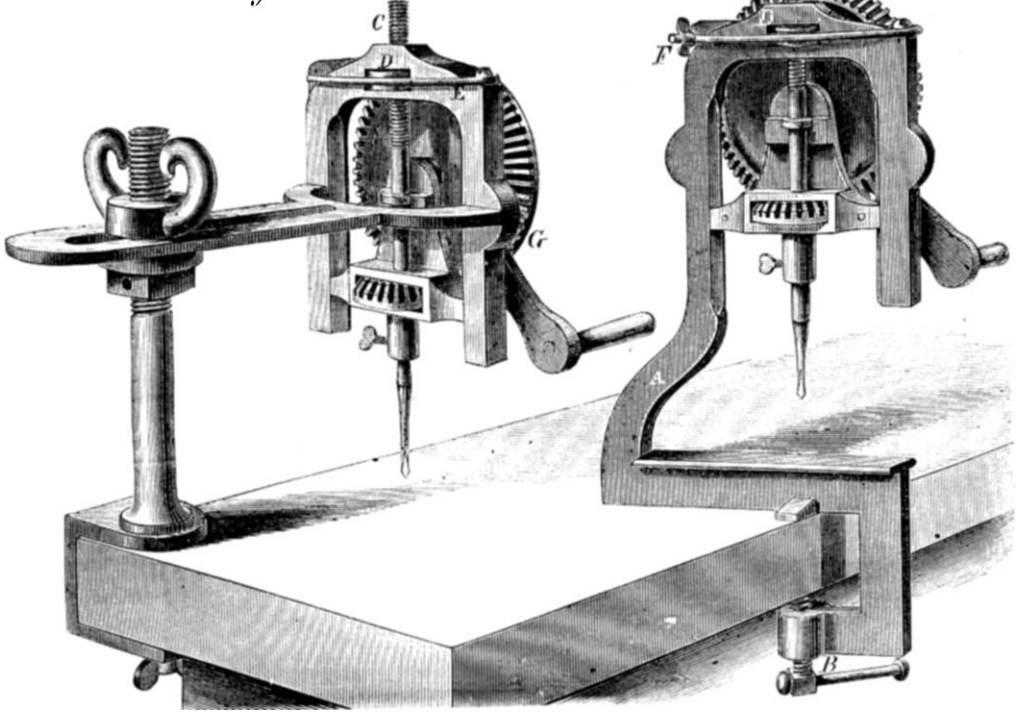

Fig. 2

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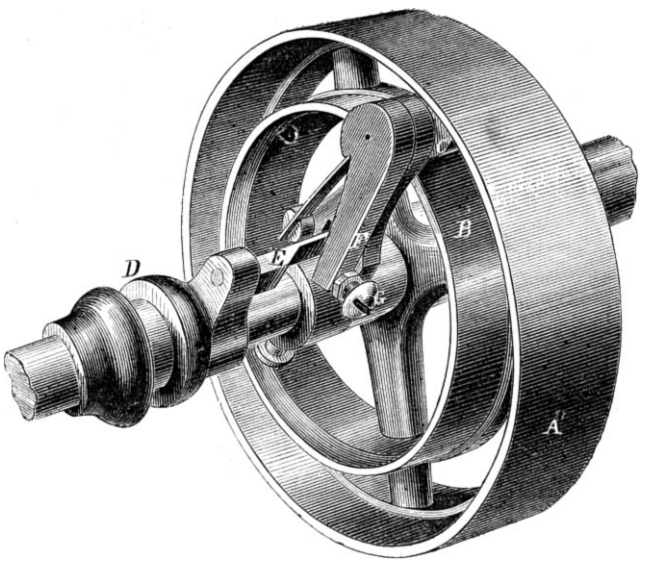
It was patented on September 27, 1864, through the Scientific American Patent Agency, by L. H. Olmstead, of Newark, N. J. For further information, address the manufacturers, Betts, Davenport & Atwood, Stamford, Conn.



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